# The Journal of the American Medical Association

**Published Under the Auspices of the Board of Trustees**

VOL. LXIII, No. 5 CHICAGO, ILLINOIS AUGUST 1, 1914


## PARENTERAL PROTEIN DIGESTION*


VICTOR C. VAUGHAN, M.D.
President American Medical Association
ANN ARBOR, MICH.


### INTRODUCTION

The units of life in our bodies are the cells of which our organs and tissues are composed. In order that we may be in health, all the cells of our bodies must be in normal condition and must function in harmony. Inasmuch as these cells are living, growing and multiplying, they must have a supply of normal food, and since these cells are made up of protein to a large extent they must be supplied with protein food. The digestive functions of the alimentary canal have been developed for the purpose of preparing proteins for the body-cells to feed on. The proteins of our food are normally broken up in the digestive tract into amino-acids. These are absorbed through the intestinal walls and serve for the nourishment of the body-cells. The blood and lymph carry to all the cells of the body the prepared and absorbed protein split products. Each kind of cell selects from these products such portions as it needs in its own metabolism. It sometimes happens that proteins reach the blood and lymph without being acted on by the digestive juices of the alimentary canal. On a small scale this is constantly happening. We absorb minute quantities of protein through the mucous membrane of the respiratory tract, and in ordinary health it may happen that small amounts of undigested or imperfectly digested proteins are absorbed through the intestinal wall. In the therapeutic employment of serums and vaccines undigested protein, sometimes in large amount, is introduced into the circulation. In case of infection, living proteins find their way into the body and there grow and multiply, converting the simple soluble proteins of the body-fluids into complex, foreign proteins. When foreign proteins find their way into the body by any of these methods they must be digested by the agency of ferments supplied by the body-cells. This process we designate as "parenteral digestion" in contradistinction to the normal "enteral digestion" which goes on in the alimentary canal. Up to the present we know but little concerning the action of the parenteral proteolytic ferments or their digestive products. We know that at one stage in enteral digestion the protein molecule yields an active poison, but in normal digestion this is split into harmless bodies before absorption. In parenteral digestion this poison is set free in the blood and tissues and gives rise to the symptoms of the infectious diseases.

How to control and modify parenteral protein digestion is now one of the big problems in experimental medicine.

The body-cells feed on the pabulum brought to them by the blood and lymph. The wandering cells, such as the leukocytes, may go in search of food, and observation has shown that they are attracted to localities in which there is accumulation of protein material, as to the intestinal walls during the process of digestion, to local infections and to points where non-diffusible proteins, living or dead, are injected. But most cells of the animal body are fixed and can act only on pabulum brought to them. The blood and lymph carry in solution both proteins and protein split products, the latter as amino-acids. Of these split products each kind of cell selects such as it may require in its metabolic process. To what extent body-cells are nourished by the amino-acids absorbed as such from the alimentary canal we do not know. Indeed, until recently it was believed that all the amino-acids formed in enteral digestion are synthesized into albumins and globulins either during absorption or soon thereafter. That this is the fate of the greater part of these protein split products is certainly true. The diverse proteins of the food are split into amino-acids in the intestine and synthesized into specific proteins, peculiar to the species, and these are distributed through all the tissues by the blood and lymph and constitute the protein food-supply of the cells. Therefore, the bulk of the protein food carried to the various organs is the same and each kind of cell must split this in such a way that the cleavage products can be utilized in its own particular structure. The liver-cell must split the albumins and globulins, one or both, in such a way as to serve its own needs, and the pancreatic cells must obtain from the same raw material, building stones cut to fit its peculiar masonry. The agencies with which this work is accomplished are known as ferments. We do not know the exact nature of any ferment. We can recognize their presence only by their effects. There must be as many kinds of ferments as there are kinds of cells, and each ferment is specific and cleaves the substrate along its own peculiar lines. From this it must follow that the cell peculiar to each organ in the animal body supplies its own specific ferment or ferments and it is by virtue of this that the cell continues to live. This conclusion reached by reasoning has been demonstrated by experiments.

### DIGESTION IN UNICELLULAR ORGANISMS

Experimental studies of digestive processes in unicellular and other low organisms have been numerous and the literature thus developed is too voluminous to

* Read before the joint meeting of the Section on Obstetrics, Gynecology and Abdominal Surgery, the Section on Pharmacology and Therapeutics, and the Section on Pathology and Physiology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, June, 1914.

be reviewed in detail. I will content myself with notice of some of the more important contributions such as enable us to understand cellular digestion in general. Leidy[1] made many observations on digestion in amebas. In the first place he called attention to the fact that amebas feed on algae and that they are most numerous where their food-supply is most abundant. He watched the ingestion of the food which is accomplished by two pseudopodia which enclose the infusorian which now lies in the vacuole and gradually loses all structure and ultimately disappears. Large amebas (*A. proteus*) feed on smaller species (*A. verrucosa*). Engulfed algae gradually turn brown while being digested. Kölliker[2] made similar observations and found the average time between ingestion and the extrusion of the indigestible portion to vary from two to six hours. Carter[3] points out that the ingestion, digestion and egestion of food substances distinguish amebas from plant-cells. Haeckel[4] regards the intracellular digestion in rhizopods as a chemical process, but fails to make any satisfactory demonstration of this belief. Greenwood,[5] from his studies of digestion in amebas, comes to the following conclusions: 1. Starch is ingested on contact but is not digested. It may be retained as long as six days, but is then rejected without change. 2. In regard to fat he is left somewhat in doubt. Milk globules are included, but after twenty-four hours they give normal and ready reaction with osmic acid. The ultimate disposal of fat was not satisfactorily determined. 3. Naked proteins (monads) are quickly and thoroughly digested by amebas. 4. Shielded proteins (enclosed by cellulose walls, such as *Torulae*) are slowly digested without break in the cellulose wall. The last point is important. It shows that the ameba elaborates a digestive fluid which penetrates the cellulose wall and digests the contents.

Next come the highly important experiments of le Dantec,[6] which show that in amebas and all infusoria, so far as tested, intracellular digestion is accompanied by the development of acid. The fluid of the vacuole surrounding the captured and ingested food becomes acid. The nature of this acid has not been positively determined, but there is no proof that it is not hydrochloric acid, and the weight of experimental evidence is in favor of its being this mineral acid. It must be understood, however, that as in the gastric juice, the acid is not the sole and effective agent. Any substance ingested by amebas, without regard to its nutritive character, starts the secretion of the acid, but only nutritious substances are digested. It follows, therefore, that we must assume the existence of digestive ferments which are active in acid fluids as is the case with the pepsin of the gastric juice. It should be stated that Krukenberg[7] found that the glycerin extract of the cellular substance of certain unicellular organisms contains a proteolytic ferment which is active only in the presence of acid.

There is no animal from the lowest to the highest, so far as investigation has been made, which does not elaborate one or more proteolytic ferments. The only organisms in which the truth of this assertion might be questioned on *a priori* grounds are parasites, which might be supposed to depend on their hosts for predigested food. Indeed, some of the first studies made on digestive processes in certain intestinal worms failed to detect the presence of specific ferments, but more thorough investigations have shown that intestinal worms elaborate proteolytic ferments which serve their own metabolism and antiproteolytic bodies which protect them against the digestive fluids of their hosts. The universally distributed proteolytic ferments of the animal kingdom are divided into those which are active in acid, and those active in alkaline solutions. The former are generally designated as pepsins and the latter as trypsins.

In unicellular organisms the chief digestive processes are intracellular. Indeed, with many of these low forms of life it has not been possible to demonstrate extracellular digestion; we are not justified, however, in denying its existence. The yeast-cell secretes a diastatic ferment which rapidly acts on sugar, but its proteolytic ferment is, under normal conditions, retained within the cell in which it functions. Since no known animal can live without protein food and since every species contains its own specific proteins, each living animal must produce proteolytic ferments. As the structure of the animal body becomes complicated and differentiation takes place, certain cells are set apart to do the preliminary digestion for the whole, but each cell must digest its own special food. Therefore, Weinland[8] is right when he states that intracellular digestion occurs in all animals.

### DIGESTION IN BACTERIA

It has been generally assumed that bacteria are low forms of plant life, but researches in my own laboratory, confirmed by later studies in Kossel's laboratory, show that bacteria contain no cellulose and are particulate, unshielded proteins and consequently are more nearly related to low forms of animal life. I should not classify bacteria as either plants or animals. In their life processes they are more closely related to animal life. Some bacteria, possibly all, can utilize split proteins in their metabolism, but under ordinary conditions they feed on unbroken, but relatively simple proteins. All bacteria, so far as studied, produce specific proteolytic ferments. In some, only intracellular ferments have been detected; in others only extracellular; in still others both are in evidence. The liquefying bacteria pour out proteases which diffuse widely through the medium and visibly demonstrate their activity. The abundance with which a given bacterium elaborates its protease is subject to many conditions. As a rule, the richer the medium in carbohydrates, the less abundant is the secretion of protease. It is probable that the presence of certain proteins in the medium stimulate the flow of the digestive agent, though, so far as I know, this has not been experimentally demonstrated. From analogy with other living cells, this is the natural assumption. For the most part bacterial proteases act in alkaline solution and, therefore, are classified as trypsins. This, however, is not without exception. Many bacteria which grow in milk and milk products digest proteins in acid mediums.

There are two points about the action of bacterial proteases which I feel justified in emphasizing. One is the fact that their activity is delayed by quinin, antipyrin and other antifebrile medicaments. This

1. Leidy: Fresh Water Rhizopods of North America.
2. Kolliker: Ztschr. f. wissensch. Zool., 1849.
3. Carter: Ann. Nat. Hist., 1863.
4. Haeckel: Ztschr. f. wissensch. Zool., 1865.
5. Greenwood: Jour. Physiol., vii, 253.
6. Le Dantec: Ann. de l'Inst. Pasteur, 1890, 1891.
7. Krukenberg: Kuhne's Untersuch., 1882, ii.
8. Weinland: Oppenheimer's Handbuch der Biochemie.

may in part at least explain the action of these drugs. The second is the fact that so far as experimental evidence has gone, no bacterial protease is capable of digesting living protein. This seems to me of great importance. The prevailing idea among morphologic pathologists seems to be that the lesions of the infectious diseases are due to the digestive action of the bacterium on the body-cell. The typhoid bacillus is supposed to feed on the walls of the intestine and cause ulceration, and the spirochetes are believed to induce the lesions of tertiary syphilis in like manner. Everything known up to the present time concerning the digestive action of bacteria is contradictory to these views. It seems quite certain that during the period of incubation of an infectious disease, the invading organism supplies the ferment, the simple, soluble non-organized proteins of the body of the host constitute the substrate, the process is largely synthetic and constructive, leading to the conversion of the simple proteins of the host into the more complex, cellular proteins of the invading organism, no marked protein cleavage occurs, no poison is set free and consequently there is no recognizable disturbance in the health of the host. On the other hand, during the active stage of an infectious disease the cells of the host supply the ferment, the complex, cellular proteins of the invading organism constitute the substrate, the process is essentially analytic and destructive, and the protein poison is set free and causes the symptoms and lesions of the disease.

It should be stated that the synthetic action of bacterial proteases, such as I have spoken of as occurring in the growth and multiplication of bacteria, whether in the test-tube or in the body, is not an assumption, but a demonstrated fact. The peptone of the culture-medium is built into bacterial cellular protein. Zak[9] has shown that pyocyaneus protease *in vitro* synthesizes simple proteins into more complex ones.

### LEUKOCYTIC DIGESTION

The phagocytic theory of Metchnikoff and the work which that distinguished investigator has done in its support are too well known to need statement, and I will confine myself to a brief review of what has been done in the study of leukocytic digestion. Leber[10] showed that sterile pus liquefies gelatin and digests fibrin. Blood-serum plates are now employed in determining the relative digestive action of leukocytes from different sources. A platinum loop carrying a few leukocytes is brought into contact with the plate at several points and the plate is then kept at from 50 to 55 C. (122 to 131 F.) for twenty-four hours. This temperature favors the digestive action of the ferments, and retards or inhibits the growth of bacteria that may be present. Each leukocytic colony digests the serum and forms a lacuna. From the depth of these lacunae the relative digestive activity of each leukocytic colony may be determined. This difference may be demonstrated by comparing the action of leukocytes from myelogenous leukemia with those from lymphatic leukemia. The blood from a case of myelogenous leukemia partially digests itself on being kept for seventy hours at 55 C. This autodigestion and the extent to which it occurs may be demonstrated by the presence and amount of albumoses formed as was first shown by Erben.[11] It should be understood, however, that normal leukocytes have a digestive action, as was first demonstrated by Pfeiffer.[12]

The protease of leukocytes may be obtained best from the blood of a case of myelogenous leukemia, by precipitating a properly prepared plasma—leukocyte mixture with alcohol, allowing to stand for some months, and then extracting the precipitate with glycerin. Similar preparations have been made from the spleen, bone-marrow and from sterile abscesses induced by subcutaneous injections of turpentine. The various methods of preparing leukocytic protease are given by Jochmann.[13] It is believed by Jochmann and others that the leukocytic protease is supplied wholly, or at least, most abundantly, from the neutrophil cells. It has been obtained from leukocytes, colostrum corpuscles, the saliva and the lochial secretion. It is supposed to digest excess of milk accumulating in the gland and possibly it may be of service to the child during the first few days of extra-uterine life. That of the lochial discharge may aid in the cleansing of the uterus.

The value of the leukocytic protease in causing resorption from wounds, in cleansing abscesses and in all local infections is well understood. It is well known that tuberculous pus, so long as it is due to an unmixed infection, is quite free from this ferment and it is believed that injections of iodoform in tuberculous, local infections bring to the site polynuclear cells which aid in effecting cure by their secretions. Whenever foreign proteins appear in the body, the leukocytes assemble and endeavor to destroy the undesired material by digesting it. It seems that the ferment is stored up largely in the leukocytes and that the most effective digestive action does not occur until the leukocytic cells disintegrate. In case of local bacterial infection many bacteria are taken into the leukocytes, and in some instances at least intracellular digestion proceeds much in the same way as it does in amebas. It is held by Müller and others that resolution in pneumonia is the result of the activity of the leukocytic protease, which becomes quickly effective from the dissolution of a large number of leukocytes. According to Bittorf[14] the urine after resolution in pneumonia quickly digests fibrin. Abnormal activity of this protease may be followed by the appearance of the digestive products in the form of albumose in the urine. This is the explanation of peptonuria in cases of chronic suppuration. When a large number of leukocytes disintegrate in a confined space the ferment set free digests any fibrin, lymphocytes and red corpuscles that may be present. The autodigestion of leukocytes leads to the production of ammonia, amino-acids and nuclein bases. Tuberculous pus does not undergo autodigestion. According to Jochmann a spleen, as large as a child's head, from a case of myelogenous leukemia, kept at 55 C., will within twenty hours break down into a dark red fluid in which the connective tissue floats. A normal spleen passes through the same change in about twice the time. The liquefied autolysate contains ammonia, leucin and tyrosin in abundance. The bactericidal action of the leukocytic protease has been studied by Nuttall, Buchner, Schattenfroh, Peterson, Kling, myself and others. One of the important questions is that of the identity of the bactericidal and the proteolytic constituents of blood-

9. Zak: Beitr. z. chem. Physiol. u. Pathol., 1912, x, 287.
10. Leber: Die Entstehung der Entzündung, 1891.
11. Erben: Wien. klin. Wchnschr., 1902, p. 276.
12. Pfeiffer: Wien. klin. Wchnschr., 1906, No. 42.
13. Jochmann: Kolle and Wassermann's Handbuch, Ed. 2, ii, 1301.
14. Bittorf: Deutsch. Arch. f. klin. Med., 1913, p. 91.

serum or of leukocytic extract. There is not time to enter the literature of this subject here.

It must be evident from what has been said that the leukocytes are constantly supplying the blood and bathing the tissues with an active proteolytic ferment. Were there no regulation of this process the body would digest itself. There is constantly in the blood an antiferment. The relation between these bodies and its regulation are among the most interesting and important matters in experimental medicine. It seems to be a well-established fact that repeated injections of a ferment into an animal leads to the production of antibody. Such bodies have been produced in this way by injections of pancreatic trypsin, pepsin, rennin and fibrin ferment, and it seems justifiable to suppose that the antiferment or antitrypsin of the blood originates in this way. Indeed, Jochmann and Kantorowicz have increased the antitrypsin of blood-serum to sixty-four times the initial amount by repeated injections of leukocytic trypsin. These investigators believe that the antitrypsin of the blood is identical with pancreatic antitrypsin, and that the former may owe its development to increase in either the leukocytic or the pancreatic trypsin. This means, of course, that the two ferments are identical and their antibodies are. There are many and diverse theories concerning the relation between leukocytic trypsin and its antibody. Laboratory methods of measuring the antitrypsin strength of blood-serum and rules are given for the interpretation of the results. Wiens[15] finds a low antitrypsin content in the blood-serum in all infectious diseases in which the polynuclear corpuscles are increased, and he regards an opposite finding as unfavorable in prognosis. Theoretically he holds that the greater the number of the polynuclear cells, the more abundantly will the trypsin be supplied and the greater the number of bacteria destroyed. Other investigators have reached radically different conclusions that is, they find that those cases do best in which the antitrypsin content is high. It seems to me that a great danger to the life of the infected man lies in the too rapid cleavage of the bacterial proteins, and at one time a rise in the antitrypsin content may save life. The relation between the leukocytic trypsin and its antibody must be a delicately adjusted one and one which fluctuates from hour to hour. Brieger and Trebing[16] and others have found the antitrypsin titer high in cancer, advanced tuberculosis, diabetes and the severe anemias, and they call it a cachexia reaction. Here again it seems most plausible that the large amount of waste protein material in the blood endangers life in case of its rapid digestion, and the large amount of antibody supplied is a protective agent. Evidently the blood is a digestive, as well as nutritive fluid, and the digestive processes taking place are regulated by a finely adjusted mechanism which at present we do not understand.

There has been for some years increasing evidence that the enzyme-inhibiting constituent of blood-serum is a lipoid. So far as I know the literature, this was first suggested by Schwartz,[17] who found that the inhibiting action of serums could be lessened by extraction with ether and restored by the addition of lecithin. Sugimoto[18] found that the extraction of serums with ether and benzol has the same effect. Jobling and Peterson[19] have apparently settled the question and reached the following conclusions: 1. The ferment-inhibiting action of the serum is due to the presence of compounds of the unsaturated fatty acids. 2. These fatty acid compounds may be removed from the serum by means of chloroform or ether. 3. Soaps prepared by saponifying the chloroform or ether extracts inhibit the action of trypsin. 4. The antienzyme action of the serum can be removed by filtering acid serum through kaolin, and can in part be restored by extracting the kaolin. 5. The decrease in strength of antienzyme in old serums is probably due to the action of serum lipase. 6. Iodin, potassium iodid or hydrogen peroxid removes the inhibiting action of the serum. 7. Soaps of the unsaturated fatty acids lose their ferment-inhibiting action when heated with serum at 70 C. (158 F.).

Leukocytes elaborate in addition to the protease, a lipase and an oxidase which we pass by since they are not germane to the subject under discussion.

Jacoby[20] and Richet[21] have shown that the liver-cells elaborate a specific proteolytic ferment, and Abderhalden[22] and his students, by the optical method, have demonstrated that: 1. Infusions of liver tissue digest liver peptone, but not peptone prepared from the kidneys or thyroid. 2. Infusions of thyroid digest thyroid peptone, but not peptones prepared from liver or kidney. 3. Infusions of kidney digest both kidney and liver peptones and to some extent that from the thyroid. 4. Infusions from muscle digest muscle peptone but not peptones prepared from liver or brain. 5. Peptone prepared from testicles is digested by infusions from testicle or from kidney. While more work along this line is highly desirable it seems safe to conclude that each kind of cell in the animal body elaborates one or more specific proteolytic ferments and that the conclusions reached by pure deduction are confirmed by experiment.

It is well established that the products of the cleavage of complex proteins by ferments vary within certain limits. A protease may digest certain proteins and have no effect on others. Some unicellular organisms feed only on certain proteins. The phyloxera feeds only on the grape-vine. Some organisms must pass one or more stages in their development as parasites in certain hosts. Examples of this kind might be multiplied, but it is well known that specific foods are essential to the life and growth of both plants and animals. I take it that this means that only certain proteins can be split along the proper lines to serve in metabolism.

The proteolytic ferments of the alimentary canal of man are capable of digesting diversified proteins, but those furnished by the cells of the blood and tissues are more limited in their action. Parenteral proteolytic ferments are of two kinds, non-specific and specific. The former are normally present in the blood and tissue, especially in the former, of all animals. They differ in kind in different species and in amount and efficiency in individuals. Their function is to break up foreign proteins that find their way into the blood and tissues. They are, within limits, general proteolytic ferments as are those of the alimentary canal; though the variety of proteins on which they can act is more

15. Wiens: Deutsch. Arch. f. klin. Med., 1906, p. 91; Centralbl. f. inn. Med., 1907.
16. Brieger and Trebing: Berl. klin. Wchnschr., 1908.
17. Schwartz: Wien. klin. Wchnschr., 1909, xxii, 1151.
18. Sugimoto: Arch. f. exper. Path. u. Pharmakol., 1913, lxxiv, 14.
19. Jobling and Peterson: Jour. Exper. Med., 1914, xix, 459.
20. Jacoby: Hofmeister's Beitr., 1903, iii, 446.
21. Richet: Compt. rend., Soc. de Biol., 1903, lv, 656.
22. Abderhalden: Ztschr. f. physiol. Chem., 1913, lxxxvii, 220, 251.

limited. They constitute the most important factor in racial and individual immunity. Man is immune to most bacteria, not because they do not elaborate poisons, for every protein molecule contains its poisonous group, but because they are destroyed by the general proteolytic enzymes as soon as they enter the tissue and before they have time to multiply. Such is the leukoprotease of the polymorphonuclear cells.

It has been shown by work in my laboratory that all proteins, bacterial, vegetable and animal, contain a poisonous group. During enteral digestion this group is, partially at least, set free, as is shown by the poisonous effect of peptone when injected intravenously; but this poison is not readily diffusible and the body is protected by the walls of the alimentary canal and a further step in the process of digestion breaks up the poison into harmless split products. When this poison is set free by parenteral digestion there is no such protection offered.

Jobling and Peterson[23] have shown that blood-serum from which the antitrypsin has been removed or neutralized is poisonous to homologous animals. In this case the blood-serum digests the proteins normal to the animal and the poison thus set free manifests its effects.

Jobling and Bull[24] find that leukoprotease digests typhoid bacilli *in vitro* with the liberation of the poison. They say:

> Freshly washed, unheated typhoid bacilli intravenously injected into dogs cause the development of definite symptoms as early as twenty minutes after the injection. Boiling for ten minutes does not destroy the toxic effects of a freshly washed bacterial emulsion. Complete solution of the bacteria (in dilute alkali) of a fresh emulsion does not prevent the removal of the toxic substance with the coagulable proteins. The action of leukoprotease splits the toxic substance to a noncoagulable state, the digested mixtures being toxic after removing the coagulable portion. The mere presence of the leukocytic ferment is not responsible for the toxicity of the filtrate from the digested mixture, and continued digestion destroys the toxicity of a previous toxic mixture. From these observations it is concluded that the toxic properties of freshly washed typhoid bacteria are not entirely due to toxic bodies that are stored in the bacterial bodies, but that these properties are due largely to products formed by hydration of the bacterial proteins through the agency of ferments present in the circulation of the animal previous to the injection, or which become mobile subsequent to the entrance of the foreign bodies into the blood-stream. Since leukocytic ferments can attack the bacterial proteins *in vitro*, it is possible that the leukocytes are a source of the ferments which are active in experimental and natural cases of intoxication with the whole bacteria.

Thiele and Embledon[25] find protein split products in the blood of animals dying of acute infection and also that the blood-serum of such animals is fatal to healthy ones when injected intravenously. Such observations seem to show quite conclusively that in the infectious diseases the invading organisms are digested, and among the digestive products there is at least one highly active poison.

## THE RELATION OF PARENTERAL PROTEIN DIGESTION TO IMMUNITY AND DISEASE

One of the most important facts developed in the study of protein sensitization or so-called anaphylaxis is that the nature and activity of cellular ferments may be modified and specific ferments developed. For instance, work in my laboratory[26] has shown that the blood-serum of a fresh guinea-pig has no digestive action *in vitro* on egg-white, while the serum of an animal sensitized to this protein does digest and lead to the liberation of the protein poison. The same is true of animals sensitized to other proteins, bacterial, vegetable and animal, all of which contain the protein poison. This offers a simple and satisfactory explanation of certain forms of immunity both natural and acquired. A man has yellow fever and recovers and is then immune to this disease. During the attack, the body-cells become sensitized and elaborate a specific ferment which destroys the virus of the disease. When subsequently the man is bitten by an infected mosquito the specific ferment destructive to this virus is promptly active, the virus is destroyed before it can multiply sufficiently to disturb health and the man is immune. The virus of vaccine, an attenuated form of the small-pox virus, is inoculated into the body, sensitizes the cells and subsequently there is for a time at least immunity to this disease. A similar explanation suffices for vaccination for typhoid fever and other diseases for which effective vaccines have been discovered.

The study of protein sensitization has done much to improve our understanding of the phenomena of infection. The pathogenicity of a given virus is determined largely by two conditions. First, the virus must be able by means of its enzymes to feed on the proteins of the animal's body. This condition determines whether or not the virus may be pathogenic to a given species. Even close kinship may exist between two species and a given virus be pathogenic to one and harmless to the other. Thus, the ordinary sheep is susceptible to the anthrax bacillus, while the Algerian variety is not. Second, the secretion of the body-cells must not immediately digest and destroy the invading organism. The small-pox virus is pathogenic to the man unprotected by vaccination or by a previous attack of the disease. To the protected man this virus is non-pathogenic because the enzymes supplied by the body-cells destroy it.

When a virus is able to feed on the proteins of the host, and the latter is not protected from the former by efficient destructive agencies, the virus multiplies within its host, converting the proteins of the latter into those of its own structure, and this continues until the body-cells becoming sensitized elaborate ferments which digest and destroy the foreign protein. This process marks the active stage of the disease. When the cleavage action of the enzymes of the body-cells proceeds too rapidly the protein poison is set free in amount sufficient to endanger life. This is a brief and incomplete statement of the relation of cellular digestion to immunity and disease.

We are only on the threshold of these studies. What further investigations may develop no one can predict. Undoubtedly theories will be modified by the further elucidation of observed phenomena and those at present held may be radically changed by the discovery of new facts.

I have recently[27] written fully on the phenomena of infection.

23. Jobling and Peterson: Jour. Exper. Med., 1914, xix, 480.
24. Jobling and Bull: Jour. Exper. Med., 1913, xviii, 453.
25. Thiele and Embledon: Ztschr. f. Immunitätsforsch., 1914,

26. Vaughan, Vaughan Jr. and Wright: Ztschr. f. Immunitätsforsch., 1912, ix, 673.
27. Vaughan, Victor C.: The Phenomena of Infection, THE JOURNAL A. M. A., Feb. 21, 1914, p. 583; Protein Split Products in Relation to Immunity and Disease, Philadelphia, Lea & Febiger, 1913.

# LIMITATIONS OF THE DIALYSIS METHOD AS A PRACTICAL TEST FOR PREGNANCY*

CHESTER M. ECHOLS, M.D.
Associate Professor of Gynecology, Marquette University School of Medicine
MILWAUKEE, WIS.

When Abderhalden first announced that he had discovered a laboratory method of detecting pregnancy based on the fact that a pregnant woman's serum has the power of digesting human placenta *in vitro*, the announcement was received by the medical profession with remarkably little skepticism. One reason for its ready acceptance in good faith was the recognized high standing of Abderhalden and the vast amount of work he had done on protein metabolism. A second and more important reason was that the medical world had already been made familiar with the basic principles involved in the Abderhalden test through the work of numerous investigators during the preceding ten or fifteen years on parenteral digestion, protein sensitization, and anaphylaxis. Theobald Smith's phenomenon, Pfeiffer's phenomenon, the work of Richet and von Pirquet, and the studies of Vaughan on protein split-products, all really anticipated the discovery of serum diagnosis, just as others before Columbus argued that the earth is round. In a recent controversy over the question of priority, Hamburger claims to have published the basic facts of serodiagnosis in 1903. To this Abderhalden replied that Huppert in 1896 published essentially the same line of argument. That the principle of serodiagnosis of pregnancy is theoretically correct is evidenced by its immediate and universal acceptance as reasonable and probable, and the wonder grows that someone had not thought of it sooner; for on *a priori* grounds, what is more logical than the inference that the maternal blood-stream, invaded by solid or soluble placental products, will develop ferments which are chorioly tic? That the mother's serum does actually contain such ferments, capable of digesting parts of the cooked human placenta *in vitro*, must now be accepted as a fact proved by thousands of tests. As to the absolute specificity of these ferments for placental proteins, there is still some doubt in the minds of a few competent observers like Pearce and Williams, Kämmerer, Flatow, Fried, Plaut, and others. Inasmuch as the last word has not been said on this phase of the subject, the question as to whether the ferments are absolutely specific for placental proteins, must in my opinion, be left open for the present, notwithstanding the protests of Abderhalden and his co-workers to the contrary.

With the exception of Jellinghaus and Losee in New York, Schwarz of St. Louis, McCord of Detroit, and half a dozen others, the number of experimenters in America who have done extensive work on the serodiagnosis of pregnancy is insignificant, while in Germany and Austria the amount of work done along this line has been prodigious. Unfortunately, some reports of work done on the pregnancy test, especially the earlier ones, must be rejected as valueless, because in some instances the wish has been so obviously the father to the thought that the author has proved whatever he set out to prove.

I have been much interested in trying to discover why so many American workers of known ability have abandoned the test after a brief and unsatisfactory experience with it. Is the test really worthless, or is the technic too difficult for the ordinary trained laboratory worker? A majority of experimenters to whom these and similar questions have been put, honestly believe the test is too unreliable to be of any practical value. It is my opinion that some of the workers were influenced to lose their enthusiasm for the test by the reflection that, after all, the making of a positive diagnosis of early pregnancy is very seldom of vital importance to the patient, as it might be, for example in carcinoma and syphilis. "Time will tell" now, as it did for our grandfathers in medicine, whether or not the woman is pregnant. This would truly be a lame excuse for indifference on our part to a laboratory proof of pregnancy. Until the laboratory test has established a better claim to our confidence, however, American clinicians, it is maintained, cannot be expected to display much enthusiasm for it, and they will continue to rely on previously known signs and symptoms, in arriving at an early diagnosis of pregnancy.

It would be manifestly improper here to go into details as to the technic of the dialysis test. Those interested are referred to the numerous original communications of Abderhalden himself, or to the excellent descriptions of the technic of the test by Jellinghaus and Losee, and by Schwarz, which are perhaps the best descriptions of the test published in English. There are, however, a few minor points of technic which in my experience are sufficiently important to justify special mention. They are as follows:

1. If the dialyzing thimbles are threaded with a fine stiff bronze aluminum wire, instead of the silk thread usually recommended, they can be handled with much greater facility.

2. Since the dialyzing tubes are not uniform in thickness, it is well to mark the different tubes with indelible ink or pencil in such a way as to indicate their relative permeability to peptones.

3. Sterile cork stoppers for the containers are superior to cotton plugs, as they prevent the evaporation of the chloroform and toluene at incubator temperature.

4. The principal control should always contain the inactivated serum from the patient's own blood, rather than that from another patient. This point has been strongly emphasized by Abderhalden himself.

5. Boiling alters the permeability of the dialyzing tubes. I have found that "pasteurizing" them in water at about 180 F. for two or three minutes is satisfactory.

6. Whatever the method used in preparing the placenta, the point of great importance is to see that the placenta preparation contains no dialyzable substance reacting to ninhydrin.

7. Finally, the test and control must be treated exactly alike (except, of course, that the latter contains inactivated serum). It is of less importance to use just so much water, placenta, serum, and reagent, than it is to use exactly the same amounts in both test and control. In making the final tests, I always boil both diffusates simultaneously, over the same flame, at the same rate, and for the same length of time.

The importance of this last precaution will be appreciated when we consider that the final test is a relative one, based in some instances on intensity of

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

color, and, therefore, the test and control must be treated exactly alike if the result is to be at all trustworthy.

Bearing in mind the preceding precautions, and also the other points of technic advocated by the author of the test, I have within the past fifteen months carried out the test on ninety-five subjects, about seventy of whom were women known to be pregnant. Nearly all these tests were made by myself in the laboratories of the Marquette University School of Medicine. This is a very small number of tests when compared with the hundreds made at the New York Lying-in Hospital, and some of the continental clinics. My series, however, has at least the advantage of having been begun late enough to enable me to profit by the mistakes of the earlier experimenters, and to avoid all that groping in the dark which made utterly unreliable all the early statistics on the dialyzation test. Without giving a complete tabulation, my results may be briefly summarized so as to bring out the two conspicuous features as follows:

First: The pregnant women of the series practically all gave positive reactions. In fact, the last fifty pregnant women of the series all gave positive reactions except one patient who was about two weeks pregnant (as proved by an abortion about two months later).

Secondly: In this series about 12 per cent. of non-pregnant persons gave positive reactions. These included several patients just operated on for acute or chronic appendicitis, pus-tubes, fibroids, and ovarian cysts.

The positive reactions in non-pregnant patients were at first attributed to errors of technic. Possibly that is the true explanation. But with the most painstaking care I have not been able materially to reduce the percentage of non-pregnant patients giving positive reactions. According to the results obtained in this series, it would appear that the test is of value in a negative sense only. That is to say, if a woman does not give a positive reaction to the test, it is safe to conclude that she is not pregnant. On the other hand if she gives a positive reaction, we can only say that she is probably pregnant. This limitation largely neutralizes the value of the test as it is now carried out.

Some of the contributory causes which in my opinion have limited the popularity and usefulness of the serum test for pregnancy are the following:

1. Although the test appears on paper to be comparatively simple, its proper execution is exceedingly difficult and time-consuming.

2. The test is not well suited for the general clinical laboratory, but should be made only by one who is doing the test every day, and always has the materials fresh and in perfect condition.

3. The presence in the blood of filterable substances reacting to ninhydrin has been noted by many observers and writers as occurring during the height of digestion, or in certain conditions of altered metabolism. These substances have been referred to as sources of possible error in the dialysis test for pregnancy. This fallacy can largely be eliminated by using for the control the inactivated serum from the patient who is being tested.

4. The presence in normal blood of non-specific proteolytic enzymes possessing feeble powers of digesting proteids parenterally is, I believe, generally conceded. It seems reasonable that these normally present enzymes might, under certain conditions other than pregnancy, cause sufficient digestion of placental albumin to vitiate the test, or at least make the result doubtful.

5. To procure for the test a sufficient quantity of serum entirely devoid of any trace of hemolysis is sometimes a matter of extreme difficulty, especially in those cases in which the blood must be transported for any considerable distance to the laboratory.

6. The use of parchment tubes or thimbles as filters, constitutes one of the intrinsically weak spots in the dialysis test. No matter how well they are made or how positively the manufacturer may guarantee them, we know that the parchment tubes are an unstable and inconstant quantity, and may be a source of well-nigh unavoidable error. Even after the tubes have been thoroughly tested and the imperfect ones thrown out, we have found that their permeability to peptones and amino-acids becomes altered by boiling, which is the only method of sterilizing them perfectly. We hold that no method of carrying out a biologic test can be an ideal one so long as it depends for its results on the integrity and constancy of a frequently boiled parchment membrane. Errors from this source need not be numerous, but the fact that they will occur now and then stands as an indictment against the absolute accuracy of the dialysis method.

A year ago I made the prediction before this section that in the course of time the Abderhalden test for pregnancy would take its place with the Widal and Wassermann tests in point of reliability. Further personal experience with the test and an observation of the experiences of other workers have convinced me that that time has not yet arrived.

SUMMARY

The dialysis test for pregnancy in its present stage of development is of value chiefly in a negative sense only; that is, if a woman fails to give a positive reaction, she is not pregnant. If, on the other hand, she gives a positive reaction, we can only say she is probably pregnant; for with our present technic, from 10 to 15 per cent. of non-pregnant persons will give positive reactions.

800 Majestic Building.

---

## VALUE OF ABDERHALDEN'S BIOLOGIC REACTIONS TO THE OBSTETRICIAN AND GYNECOLOGIST *

HENRY SCHWARZ, M.D.

ST. LOUIS

At the present state of the investigation it is possible with the aid of Abderhalden's dialyzation reaction and with his optic method to demonstrate the strict specificity of the so-called protective ferments, demonstrating thereby at the same time that the protoplasms of the various organs and tissues of the animal organism differ sufficiently from each other in chemical structure to be recognizable with the aid of these ferments, even after they have been boiled or after they have been reduced to the peptone stage. It is possible to prepare placental albumin and placental peptone which will be readily cleft by pregnancy

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

serum, but which will not be cleft by other serums and certainly not by serum from a cancer patient; on the other hand, it is also possible to prepare coagulated cancer tissue which will be cleft by cancer serum and which will not react with the serum of pregnancy.

Thus, by making a number of cross-examinations, examining the same cancer serum and the same pregnancy serum against the same placental albumin and the same cancer albumin in the same experiment, and finding under these conditions that cancer serum reacts with cancer tissue only, and that pregnancy serum reacts with placental tissue only, one proves the specificity of the protective ferments and the specific structure of the various protoplasms. This demonstration is constantly made in Abderhalden's institution; it has been made in a few other laboratories; it has been made time and again in the laboratory of the Department of Obstetrics of Washington University; my associates and I have taken great pleasure in making these demonstrations before the numerous visitors, including experienced laboratory men, who have come to St. Louis for the express purpose of studying certain points of technic.

Obstetricians and gynecologists have a certain advantage in this investigation, which should mean that they also have a certain obligation to assist in demonstrating the truth of this new doctrine. In the women's clinic pregnancy cases and cancer cases are always to be found; the material for preparing albumin or peptone can be obtained fresh from the delivery room or from the operating pavilion; the special precautions in obtaining and handling serum can be readily observed; the women's clinic, therefore, must become the training camp for those laboratory men, who wish to engage in research work in this new field.

It is a waste of energy and material to attempt investigation of other conditions and to work with other organs and tissues before the investigator has learned the fundamentals of this work and has tested the efficiency of his technic on the touchstone of the cross-examination of pregnancy and cancer.

Be it remembered that in these two examinations the material for the preparation of albumin or peptone can be obtained in perfectly fresh condition; while, when working with other organs and tissues, we must obtain the material from the necropsy room or else we must substitute animal organs and tissues, which substitution is not as yet justified on the basis of convincing experiments. The fact that we can prove that the protective enzymes found in pregnancy and in cancer are specific, does not mean that we are willing to use these biologic reactions for diagnostic purposes without the greatest reserve.

The serodiagnosis of pregnancy, even in expert hands, is subject to error on account of unreliable dialyzing thimbles; danger from this source is reduced, but not eliminated, by multiplying tests and controls. The optic method eliminates this source of error. We find, however, that peptone obtainable in the market is not always reliable and have therefore started to prepare our own peptone. It is true that the manufacturing chemist can do this work better and cheaper than we can, but we can start with a blood-free placental preparation, which is so essential a point that we are unwilling to entrust this work to the manufacturer; we also need other peptones which are not offered on the market.

Besides this source of error contained in the dialyzation method, it must be remembered that, even when the test works out correctly, a positive reaction simply means that the case in question harbors placental elements; usually it means that the patient is pregnant. Placental elements, however, are often harbored in the uterus or even in other parts of the body for long periods after delivery; this is especially true in cases of hydatidiform mole, in which the retention of syncytial cells is so apt to lead to the development of chorio-epithelioma.

These tumors, being of placental origin, naturally give a positive reaction with pregnancy serum. We have a case under observation, at present, of a woman who passed a hydatidiform mole over three months ago, who menstruates regularly, who is not pregnant and whose serum continues to react positively with placental preparations. It is for these reasons that we are unwilling to consider a positive reaction of serum with placental preparations a convincing proof of pregnancy, except in connection with the clinical history of the case and in connection with a thorough physical examination. Even with these limitations the serodiagnosis of pregnancy has been of real service to us in arriving at a correct diagnosis in a number of perplexing cases.

In the serodiagnosis of cancer we have likewise found various difficulties. The serum in a suspected case may give a negative reaction although the case is one of cancer; this seems to happen when the cancer tissue used in the test is of different histologic structure from the cancer on which the test is made. We also find difficulty in securing cancer material which can be rendered blood-free and which is free from infection; at other times, it is not possible to isolate the cancer tissue from the tissue of the affected organ. So far it has not been possible to prepare the desirable quantity and varieties of malignant albumins; as regards the preparation of cancer-peptones, this has been simply out of the question.

In the course of time we hope to have on hand coagulated preparations made of the various forms of malignant tumors, but until we are thus provided, we must expect to get negative reactions in cases which differ in histologic structure from the cancer material used in the test.

Eventually, it will be possible to test the serum of suspected cases against mixtures of cancer albumin and cancer peptones and, in case of positive reaction, to ascertain the histologic structure of the tumor under investigation by a second series of tests against the component albumins or peptones of these polyvalent mixtures. The serodiagnosis of cancer will be of considerable value in those cases in which it is not possible to obtain material for microscopic examination before a serious operation is undertaken. The following is a case in point:

A woman, aged 68, suffered with pain and swelling in the region of the gall-bladder, and with jaundice; the diagnosis pointed to malignant disease, but a stone in the common duct could not be entirely excluded and an exploratory operation seemed indicated. The serodiagnosis made the diagnosis of malignancy positive, for the patient's serum reacted positively with cancer albumin and negatively with placental albumin; there was no need for removing the patient from a comfortable home and from her family; she died several months later of cancer of the liver.

Serodiagnosis of cancer is of still greater value for controlling cases after radical operations and for watching for a return of disease; also for observing

the effect of Roentgen-ray treatment and other therapeutic measures on cancer cells.

The difficulty of securing reliable cancer preparations for this control work has induced us to use the material obtained at operations, regardless of its fitness for general investigations. The serum of the patient is obtained on the morning of the operation; the material obtained at the operation is prepared as well as conditions permit; a small portion of it is used immediately against the patient's serum and gives, as a matter of course, a positive reaction; the rest of this preparation is preserved for the patient's individual benefit and will answer for the control of her own case, although usually unfit to be used in tests on other patients.

This work was started only a few months ago; it is too early to estimate its actual value. This much is evident; the serodiagnosis of pregnancy and cancer by these biologic reactions is already of considerable practical value, but, at present, these methods are not suitable for the routine work of commercial laboratories; the attempt to employ them outside of research laboratories, closely connected with a hospital service, must lead to disappointment and tends to retard real progress in this field.

The demand for easier and quicker methods of serodiagnosis has induced Abderhalden to make the attempt to demonstrate the action of proteolytic ferments by the method used by Gruetzner in demonstrating the action of pepsin. Gruetzner uses fibrin stained with carmin; when some of the fibrin is digested, the carmin is set free, the solution of pepsin is thereby stained pink. My associate, Dr. Newell, has used carmin-stained placenta according to Abderhalden's directions, placing about 0.25 gm. of this tissue and 2 c.c. of serum in small test-tubes; after approximately eight hours, the tests containing pregnancy serum turned pink, while the control serum was still yellow, later, as all serums turned more or less pink, it seems worth while to continue these attempts. Abderhalden is also experimenting with other stains, and he advises against the use of this method at present, except in the way of experiment.

440 North Newstead Avenue.

## ABSTRACT OF DISCUSSION

### ON PAPERS OF DRS. VAUGHAN, ECHOLS AND SCHWARZ

DR. HERMAN J. HOLDT, New York: I am in accord with what Dr. Echols has said concerning his clinical experience and the conclusions at which he has arrived from his studies. I am not in accord, however, with those who wish to entirely obliterate serodiagnosis, the test of Abderhalden for the purpose of making a diagnosis of pregnancy. That is an unjustifiable position to take, both scientifically and with regard to the work done by those who have paid attention to it. Would any one dare to make a diagnosis of any illness by a single symptom, be that objective or subjective? I believe not. I believe that we should therefore class the dialysis method as only an objective symptom in the chain of symptoms for the purpose of establishing a probable diagnosis, and as such I regard it. Three or four months ago I saw in consultation a woman who was supposed to have an intra-uterine pregnancy. When questioned she gave subjectively a typical history of an ectopic gestation, and objectively this was confirmed. We must remember that between uterine abortion and an ectopic gestation or tubal abortion, it is at times difficult to draw a dividing-line in diagnosis. Subjectively the patient showed the condition of an ectopic gestation, I thought there was a hematocele posterior to the uterus. Since she had no symptoms leading me to believe that she must be immediately operated on I thought it best to keep her under observation. Her condition did not change. For two weeks she was kept at the hospital, when I suggested operating. We found a soft incarcerated subperitoneal myoma, that she had been pregnant and had aborted. The Abderhalden reaction in that instance proved negative. I thought that here was an instance in which we could make the diagnosis by the dialysis method and that it had failed. It did not fail, because we did have a negative reaction. We know that the Abderhalden test is always negative a few weeks after expulsion of the fetus. Another case was that of a woman brought by a physician to have her uterus removed. The examination showed the presence of a myoma. She had been seen by a number of colleagues. All advised operation without further delay. The menstrual period had been last seen six weeks previously and she had some gastric disturbance; there was a slight lividity about the mucosa of the vagina. I concluded that there was probably a myoma present in connection with early pregnancy. The Abderhalden test gave a positive reaction. The woman was extremely anxious to have offspring. They had been married fifteen years. In connection with the subjective symptoms I believe I had a right to advise her to await conditions. Under these circumstances we have no right to discredit such a scientific sign of diagnosis if we regard it as only one of the conditions in connection with the case.

DR. CHARLES S. BACON, Chicago: The interest in this subject is not only that due to the question of diagnosis, but to the broader question of ferment digestion. Experiments in the University of Illinois comprise work done by the research fellow in this department. Our results conform almost exactly to those obtained by Dr. Echols, and we cannot agree with Dr. Schwarz in finding a specific ferment in these cases. In the number of observations made care is taken to follow Abderhalden's method exactly. The care that we have taken in the control and the amount of material we have used in making observations on other classes of cases make our conclusion worthy of consideration.

DR. PHILIP F. WILLIAMS, Philadelphia: We have been working with the Abderhalden test for pregnancy at the University of Pennsylvania for the past two years. In our earlier work we confined our efforts to the dialysis method in pregnancy. Every pregnancy serum examined gave a positive reaction, but a number of serums from non-pregnant patients also responded positively. When we used uterine carcinoma tissue as substrate we found a digestion of this tissue as well as of placenta by the pregnancy serums. As the dialysis shells were found to be unfit for use after the preliminary tests in more than 50 per cent. we devised a method of coagulation and filtration. By this we also had an occasional positive reaction in a non-pregnant serum. Our animal experiments consisted in the injection of kidney tissue into dogs and rabbits. After a single injection, ferments were developed which digested liver tissue as well as kidney tissue; after multiple injections there seemed to be a tendency for a more definite digestion of kidney tissue. The commercial placental peptone was used with pregnancy serums in the polariscopic method. Our poor results may have been due to the peptone, for in but few cases did we obtain a change of more than 0.04 degree. We have tried to measure the amount of amino-acid in a mixture of pregnancy serums and various placental preparations, before and after incubation, using the Van Slyke deamination apparatus, but have not obtained any definite data at present. In reviewing our work of the past two years we cannot feel that the pregnancy ferments are of a specific nature.

DR. F. H. FALLS, Chicago: In our work with the Abderhalden test in the University of Illinois we followed the technic absolutely as given by him. We found that fully 12 per cent. of normal persons gave a positive reaction, following exactly the same technic used in examining the pregnant patients. That led us to examine the serum of various pathologic conditions and in these also we found many positive reactions. It seemed important to find what pathologic condition would give positive Abderhalden tests. We investigated cases of pneumonia, nephritis, splenomyelogenous leu-

kemia, acute articular rheumatism and other conditions. Many gave positive Abderhalden reactions when exactly the same technic was used as in the pregnancy test with the placenta as a substrate. This will to a certain extent vitiate the reliability of the Abderhalden test. I think the technic is not too difficult for a person to develop and use who has had experience in the serologic work. I might say that, so far as the cancer problem is concerned, it has been my experience that serum from cancer patients will digest placenta as a substrate. This is not true in every case, however, and there seems to be no definite relation between the extent of the cancer and the digestion that the serum will give. Concerning the boiling of the dialysis thimbles as given by Dr. Echols, we found that boiling No. 579 Schlicter thimbles for two minutes did not cause permeability of the thimbles within a reasonable length of time. I used the thimbles for a month or so and tested them repeatedly, and in no case was there the slightest trace of color. After using a set of thimbles for three months they were discarded, not because they let through albumin, but because their equivalent permeability to peptone had been altered. I think it important to run the inactivated serum control. Only so can we judge the reaction. If, as Dr. Echols said, the inactivated serum-control was negative in cases taken at the height of digestion, then it cannot be the amino-acids present in the blood, but ferment activity in the active serum that accounts for positive reactions under these conditions.

DR. CHARLES GOODMAN, New York: During the latter part of last year it was my privilege to learn in Abderhalden's laboratory the technic of the dialysis test described by him. It was my intention to employ the test in seeking a method of overcoming autolysis in homotransplantation of organs. In a series of transplantations in fourteen dogs we were able to demonstrate the presence of a ferment capable of digesting suprarenal tissue in the presence of a transplant of the thyroid gland. In a series of cases of pregnancy, my assistant, Dr. Berkowitz, and I were able to demonstrate the presence of a specific ferment with a uniform degree of success by the Abderhalden dialysis test. In a series of cases of malignancy we have been able to demonstrate the presence of a specific ferment capable of digesting carcinoma or sarcoma in thirty-one out of thirty-two instances. We always used serum thimbles as a control. A negative result is of more value than a positive reaction. The test is exceedingly delicate, and false and divergent results may be obtained owing to slight errors in technic. The technic is complicated and difficult but not beyond the realm of possibility of being mastered by serious and diligent application. The fundamental rules of the test must be obeyed. We must not condemn the method because it requires careful working. Professor Abderhalden advised me and the other workers, after having made use of the thimble, to cleanse it in running water for thirty minutes and then drop it into boiling water for fifteen seconds and no longer, because if it boils it becomes thick. After the thimbles have been in boiling water for fifteen seconds they are put into a container of sterilized distilled water and toluene and kept for use.

DR. MICHAEL G. WOHL, Philadelphia: We forget that Abderhalden's reaction has its restrictions and we demand too much from it. The apparent simplicity of the test is responsible for the great inaccuracy of the results obtained through not paying strict enough attention to its technic. Among the errors pointed out I wish to emphasize the importance of boiling the dialysate. The reaction is more quantitative than qualitative. A definite amount of protein cleavage products present in the diffusate combine with a definite amount of ninhydrin giving the violet color. Now, if there is less of the protein cleavage products or less ninhydrin, you will either get a faint reaction or none. The unequal boiling, therefore, whereby you obtain in one instance a greater concentration of the diffusate, and in another a lesser, will be responsible for the divergent results. We count one minute from the time bubbles appear in the test-tube. The amount of water added to the beaker outside of the thimbles must always be uniform (20 c.c.). As Dr. Echols said, it is not necessary to pay much attention to the quantity of water added to the outside of the thimbles. I believe that this may account for the discouraging results. I hope that soon we may have a uniform color-scale by which each worker may determine the end-results of the reaction. On the specificity of the ferments the future of the reaction depends. From our work with this reaction in nervous diseases in the neuropathologic laboratory of Dr. Weisenburg and in the Samaritan Hospital, I believe that the reaction is organ specific.

In our cases we find that serums of male patients with dementia praecox digest testicular tissue, and serums of female digest ovarian tissue. Is this not sufficient evidence of the specificity of the ferments? True, we may, under certain conditions, get cleavage of placental tissue or of any tissue with serums of non-pregnant patients, when there is a leukocytosis. As is well known, leukocytes contain non-specific proteolytic ferments and, consequently, serums from patients with an inflammatory condition might give a positive reaction when a negative reading was expected. We make a differential blood-count in all such cases. Another possibility of error lies in some hemorrhage, bruise or hematoma whereby through the hemolysis of the red cells a ferment is liberated which might possibly cause cleavage of protein substances. Do not condemn the reaction in an off-hand manner if it has not met your expectations. Realize the qualitative nature of the test. Search for the cause of your wrong reading. Because you get the positive Wassermann in yaws or psoriasis you do not necessarily discard the reaction but govern yourself in accordance with the clinical picture. Why not apply the same rule to the Abderhalden?

DR. CLARENCE F. BALL, Rutland, Vt.: I contradict the statement that cancerous and pregnant conditions will interact generally. I have a series of nearly 100 cases in only a very few of which has pregnancy given a cancer reaction or cancer a pregnancy reaction. Some of the cases have come to operation and I have not been able to demonstrate third-degree proliferation of the epithelium; there was a second-degree proliferation, however. My work in all of these cases has been done running four thimbles: one with activated serum, one with the serum and cancer tissue, another with either serum alone or the tissue—whichever I suspected, and the fourth with placental tissue. I use the cancer tissue for the primary test; placental for the secondary fundamental. The question of the validity depends on more than 90 or 900 cases: it depends on work which must be as extensive as that on the Wassermann has been. It may share the same fate as the Wassermann, or even worse. I believe, however, that there is a better future for the test. I have followed Dr. Schwarz' modification of the Abderhalden test, although I have not been to Dr. Schwarz' clinic. As to the question of cancer fundaments, obtain all your cancer tissue with as many cells as you can obtain free from the tissue invaded. The tissue that I have had the best results with has been that from a metastasis in which practically all of the tissue was cancer cells.

DR. O. LOWY, Newark, N. J.: I have done considerable work in dialysis and have found that, as Dr. Wohl has brought out, the question of boiling is very important. To do away with some of the uncertainty I boil my solutions in a water-bath and instead of boiling for one minute I boil them for ten, using the four-thimble method and the activated serum. At the end of ten minutes I read the result. In using the flame a different heat is obtained according to the position in which the test-tube containing the serum is held, whether toward the center or end of flame. Another method to which I resorted to overcome error is: in a positive result I retest that same thimble at once against albumin. If the albumin gives a positive result my test is of no value. If it is negative I test against peptone. If that is positive I know that my test is right. As far as the value of the test is concerned, only the cumulative evidence of thousands of cases will do that. Up to the present we have tested 150 to 180 cases of cancer. In a number of cases of diabetes I have obtained a positive result; why, I do not know.

DR. A. J. CARLSON, Chicago: There is a fundamental discrepancy between one of Professor Abderhalden's statements

and one of the main points in Dr. Vaughan's paper. Abderhalden takes the position that normal blood contains no polyvalent proteolytic enzymes, while Dr. Vaughan maintains that "the blood is a digestive fluid." Just there lies the main source of error in the practical utility of the Abderhalden test. I have had no personal experience with this test, but I have done some work on the ferments of the blood. I cannot accept Abderhalden's dictum as to the absence of polyvalent ferments in normal blood. I predict that normal blood will be found to contain polyvalent ferment or ferments, that when specific proteins are liberated into the blood, specific ferments are produced. That means that the Abderhalden test must be, not a qualitative, but a quantitative one. Of course I admit that the question whether or not normal blood-serum contains polyvalent ferments is a difficult one to decide. We have no means of obtaining serum identical with the plasma of the circulating blood. Dr. Vaughan emphasizes particularly that the leukocytes and the blood platelets are the source of some of these ferments. That may be partly true, but I wonder whether he is not unduly influenced by the distinguished gentleman across the water—Metchnikoff. In regard to many of the immune bodies I am confident on the basis of work by Dr. Hektoen and myself that tissues other than the leukocytes are the most important.

DR. HENRY SCHWARZ, St. Louis: I wish to say, since a great many men are influenced by the technic which I had given out, that there is one point about boiling the thimbles which was incorrectly stated in my paper read at Providence, R. I. I there stated that I boiled the thimbles five or six minutes. I do not. Such boiling spoils the thimbles, rendering them impermeable. We simply dip them in boiling water for not more than fifteen seconds, as Abderhalden suggests. A great many men with just as much training as Dr. Falls undoubtedly has, and with similar experience, have found when they published their results and their methods, that some little point of technic was wrong, which upset the whole matter. We are all willing to admit that the thing is not quite ready for everybody to work with; we are not quite ready to advise serodiagnosis of pregnancy or cancer, on a commercial basis at any price. We would not take any money for it, but we are all working in the same field and we are trying to make good. There are others who are not obtaining convincing results. Come to St. Louis, we shall be glad to show you in our laboratories the work that we are doing.

## THE USE OF SALVARSAN IN NON-SYPHILITIC DISEASES*

WILLIAM H. BEST, M.D.
Assistant Visiting Physician, Department of Cutaneous Diseases and Syphilis, Kings County Hospital
BROOKLYN

Although the use of salvarsan, first introduced as a *therapia sterilisans magna* in syphilis, has been somewhat of a disappointment as such, its influence on certain non-syphilitic diseases has been so pronounced that it is being used in an ever-increasing number of diseases, with the idea of enlarging its sphere of usefulness. So far as I know, however, no attempt has been made to use this drug on the basis of the relationship of the physiologic action of salvarsan to the etiology, pathology and manifestations of the disease treated. One can hardly call the treatment empiric. It has been used with the idea of what result *will* be obtained, rather than what result *should* be obtained.

In the fall of 1910, shortly after the introduction of salvarsan in the Kings County Hospital we noticed the coincident improvement of the tuberculosis in several cases of syphilis complicated by this disease. This rather unthought-of and unlooked-for result first stimulated our attention to the possibilities of salvarsan in non-syphilitic diseases.

For the past three years we have been conducting, on the service of Dr. J. M. Winfield at Kings County Hospital, a series of investigations with a view of establishing the underlying factors that govern the success or failure of salvarsan in the treatment of non-specific conditions. That some diseases respond as readily to salvarsan as does syphilis, that others are improved, that some act indifferently toward it, and still others are absolutely uninfluenced by it, can be readily seen by a quick survey of the literature; but it requires a close study of the relationship of the physiologic action of salvarsan to the etiology, pathology and manifestations of these diseases, before we can hope to explain these phenomena on a scientific basis.

The diseases treated by us include cases of anemia, chancroid, chyluria, elephantiasis, epithelioma, erythema multiforme, leprosy, lupus vulgaris, pityriasis rubra, psoriasis, tuberculosis and trichinosis. Realizing the limited scope of our cases, I have supplemented them with a review of the literature. The cases treated by us have been grouped with those taken from the literature for the purpose of obtaining a composite picture of what may be expected from salvarsan therapy in each individual disease.

### EFFECTS OF SALVARSAN IN VARIOUS DISEASES

*Acanthosis Nigricans.*—One case was treated with three injections of salvarsan. The general condition improved and the skin lesions disappeared. This patient had a scar which resembled a healed chancre.

*Aleppo Boil (Oriental Sore).*—Of twelve patients treated, four were cured, one improved, five were uninfluenced, and in two the results were very doubtful. Most of the patients received two intravenous injections at ten-day intervals.

Petersen[1] declares, from his observation, that salvarsan is almost specific in this condition. Lubenau,[2] in 1912, asserted that salvarsan shows almost specific results in kala-azar.

It has been asserted that Aleppo boil and kala-azar are kindred affections. Sir P. Manson has advanced the theory that Aleppo boil bears the same relation to kala-azar as vaccinia does to variola. That is, the protozoan of Aleppo boil is in reality an attenuated Leishman-Donovan body, producing on the one hand merely the local lesions of Aleppo boil, while in its more virulent form producing the severer constitutional disease kala-azar. The camel he believes to be the attenuator of this parasite, as is the cow in the case of the germ of variola.

Petersen and Lubenau, however, stand alone in their declaration of the specificity of salvarsan in Aleppo boil and kala-azar. Their statements are not borne out by the results obtained by other investigators.

*Amebic Dysentery.*—Three cases of several years' standing were treated with intravenous injections of salvarsan. After the first injection the amebas, blood and mucous disappeared from the stools. Within a few days the stools lessened and became formed. One patient received a second injection and all three remained well.

* Read before the Section on Dermatology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Petersen: Russk. Wratschr., 1912, No. 43.
2. Lubenau: Diss., Strassburg, 1912.

*Anthrax.*—Three patients are reported as having received several injections each. Improvement was noted after the first injection, the cases going on to recovery.

Experiments on dogs by Shuster[3] showed a killing of bacilli with salvarsan. Another investigator[4] reports curing dogs of anthrax, giving them 0.04 gm. per kilogram of weight. He feels assured that 0.6 gm. will effect a cure in man.

*Anemia.*—Here are considered only cases of the primary progressive type. Of thirteen cases, each receiving one or more intravenous injections, six showed remission (increase in red cells approximating normal, and improvement of general condition), two a marked benefit, two improved at first but relapsed, and two showed no benefit. The remaining case was too recent to venture an opinion.

*Bilharziasis.*—Out of five cases, the results in four were absolutely negative. In the fifth, there was a disappearance of ova and miracidia from the urine, but Fulleborn and Werner,[5] who report the case, argue that this does not necessarily mean a cure. According to them the best that can be said for salvarsan in bilharziasis is that it has an influence on the vitality of the miracidia.

*Carcinoma.*—Seven cases were treated with intratumoral injections of salvarsan in neutral suspension. Some of the patients declared that there was a lessening of pain, and in a few instances the mass seemed to become temporarily smaller; otherwise there were no favorable results noted.

Several cases of epithelioma were treated with local applications, but no improvement followed.

*Chancroid.*—One case in which the Ducrey bacillus was demonstrated received intravenous injections of salvarsan, and in thirteen days, it is asserted, the chancroid condition had healed. No local treatment was used.

This is not in accord with our results at Kings County Hospital, where a number of chancroidal conditions were treated locally with salvarsan in oily suspension, as a 10 per cent. ointment, and as a dusting-powder. We have never seen any influence on the chancroids that could be attributed to this local treatment. In a case of syphilis in which chancroids existed coincidently, an intravenous injection did not heal the local condition.

*Sydenham's Chorea.*—Some of the cases were of two years' duration. Thirty-five cases received from two to four doses of from 0.2 to 0.6 gm. each, some given intramuscularly and some intravenously. Without any exception these patients recovered in from two to four weeks.

*Dermatitis Herpetiformis (Duhring's Disease).*—Five patients have been treated with from one to three intravenous injections. Three responded quickly and completely, one responded more slowly, and the remaining case received quinin as an adjuvant with gratifying results.

*Erythema Multiforme.*—One case has been reported in which salvarsan had no apparent effect on the course of the disease. In another case (bullous type) of our own at Kings County Hospital, the patient received no benefit from an intravenous injection, and died within a couple of weeks after admission. This was the second attack within a year, the patient recovering from the first attack under ordinary treatment in about five weeks.

Some authorities have tried to create a relationship between dermatitis herpetiformis, erythema multiforme and urticaria, since the eruptions of all three are at times seen either at the same time or at different times in the same person. Judging from the response of dermatitis herpetiformis and erythema multiforme to salvarsan, it does not seem as if there is much in common underlying the diseases.

*Filariasis.*—Under this head are grouped the diseases caused by the *Filaria sanguinis hominis*. They are designated elephantiasis and elephantoid diseases. Of the latter, chyluria is the only one in which salvarsan therapy has been used.

Two cases of elephantiasis are reported as showing negative results after the intravenous injection of salvarsan. In one case treated by us the filaria could not be found in the blood after one injection of salvarsan, but of course the enlargement and induration of the lower extremities, which was the part affected, were not lessened. If it is necessary to reduce the affected parts to their normal appearance before we can pronounce a cure, elephantiasis must of necessity be incurable, since these changes are permanent. If, however, the disappearance of filaria from the blood can be taken as an index of the cure, the apparent disparity in the results may be accounted for by a difference of opinion as to what constitutes a cure.

Two cases of chyluria have been treated with one intravenous injection of salvarsan each. In one case the urine started to clear within seventy-two hours, but in the other case the urine persisted cloudy for some time. In both cases, however, repeated examination of the blood for two weeks disclosed no filaria.

*Frambesia (Yaws).*—Two thousand four hundred and thirty cases have been reported. The intramuscular and intravenous methods yielded equally good results. With a few exceptions a cure was effected in from two to three weeks. The few exceptions were improved and later cured by a subsequent injection. In only a few instances were three injections necessary. Even after boiling, the serum from patients who have recovered is reported to be as efficacious as salvarsan itself. Hospitals for the treatment of frambesia, with a daily census of several hundred patients, have been closed since the use of salvarsan.

*Hodgkin's Disease.*—Three cases were treated with injection of salvarsan into the accessible enlarged lymph-nodes. It made no impression, however, and the disease ran its usual course.

*Keratosis Follicularis (Darier's Disease).*—Temporary improvement was noted in one case, but a cure was not effected.

*Leprosy.*—Thirty patients have been treated, mostly with intramuscular and subcutaneous injections. Sixteen of the cases were uninfluenced. The remaining fourteen showed various degrees of improvement. Different observers report a lessening of the nasal secretions, disappearance of bacilli from the nasal secretions, retrogression and in some instances disappearance of nodules, and improvement in the abnormal sensations. They all agree, however, that these improved cases, even the most pronounced, were only temporary. Later new nodules formed and the disease progressed its usual course.

3. Shuster: München. med. Wchnschr., 1912, No. 7.
4. Therap. Monatsber., December, 1912.
5. Fulleborn and Werner: Deutsch. med. Wchnschr., 1912, No. 8.

*Lichen Planus* (*Lichen Ruber Planus, Lichen Hypertrophicus*).—Seven cases, in each of which two injections of salvarsan were given, have been reported. In one case, about an hour after the first intravenous injection, there was a reaction consisting of redness, burning, and swelling of the lesions, which soon subsided. Twenty days after the second injection the eruption improved, and although the observer could not report a complete cure, he felt certain that salvarsan was more effective than any other treatment he had used. Another case, after two intravenous injections at ten-day intervals underwent retrogressive changes which led to a complete cure. Two cases in which intramuscular injections were given showed slow disappearance of the lesions. The remaining three cases were not influenced by the treatment.

*Lupus Vulgaris.*—Of eighteen patients, twelve were treated with salvarsan alone, and six received tuberculin in conjunction with the salvarsan. Repeated injections were given at four-week intervals in most of the cases. It is noteworthy that after the first injection some of the cases showed local reactions much like tuberculin skin-reactions. Of the twelve patients treated with salvarsan alone, three, after several injections, showed improvement, and the remainder were uninfluenced. Of the six patients treated by the combined method, all were cured in a comparatively short time.

*Mycosis Fungoides.*—At the meeting of the New York Dermatological Society, December, 1912, Dr. Jerome Kingsbury presented a patient whom he had treated with repeated injections of salvarsan, with marked improvement.

*Malaria.*—Fourteen patients with either tertian or quartan type were treated with intravenous injections of salvarsan. In no cases were the plasmodia demonstrable after the injections, and the clinical symptoms disappeared.

*Pemphigus.*—Under this head are considered three allied skin-eruptions, pemphigus chronicus or vulgaris, pemphigus vegetans, and pemphigus foliaceus. These three affections are considered by some as distinct entities, but there is much in favor of their being merely different manifestations of the same disease.

One case of pemphigus vegetans responded well to salvarsan, while in a case of pemphigus foliaceus it was ineffectual. Neither did quinin in ascending doses produce any effect on this case. In another case of pemphigus foliaceus a better condition of the skin, less pruritus, less exudation, and more abundant exfoliation were noted. The patient died, however, having received only three small intravenous injections. Thirteen patients with pemphigus vulgaris were treated with one or more injections. Six of these have been reported cured (two requiring a second injection), and seven were treated without any benefit.

If we take into consideration that these cases are reported from different sections of the world, and remember the unsettled ideas prevalent concerning the bullous eruptions, and the fact that these patients sometimes recover spontaneously, we may find therein the reason for such diverse results.

*Pellagra.*—Seventy-four cases have been reported, most of the patients being treated with repeated injections, intravenously. Two of these cases had positive Wassermanns, so we shall exclude them from the discussion. Twenty-three cases showed no definite improvement. Forty-nine cases, four of which had mental symptoms, showed different degrees of improvement, the majority going on to recovery. It might be stated that twenty-one of the cases in which no results were obtained are all reported by the same observers,[6] while the cases in which there was improvement and recovery are reported by seven other observers from different parts of this country.

*Pityriasis Rubra* (*Dermatitis Exfoliativa*).—One case showed progressive improvement after the fourth day. Ultimate results were not reported.

At Kings County Hospital a case of exfoliative dermatitis which later assumed the Wilson type, and which had resisted treatment for several years, was treated with weekly intramuscular injections of 0.1 gm. salvarsan suspended in oil. The treatment was continued for ten weeks, at the end of which time, though some redness persisted, exfoliation ceased, and the skin approached normal. The patient left the hospital but returned six weeks later with the condition as bad as it had been. Salvarsan therapy was again instituted with the same gratifying results. The patient at present has an almost normal skin with only an occasional circumscribed area of redness and scaling developing. It is interesting to note that this patient, although only about 35 years of age, has an advanced arthritis deformans, the onset of which preceded the skin condition.

*Psoriasis.*—Ten cases reported were subjected to salvarsan treatment. In three patients, each receiving two injections, the eruption disappeared in from three to four weeks. In four cases the scaling increased and the eruption seemed to involute for a few days, but after that remained stationary. Three cases were absolutely uninfluenced.

We have treated ten cases of psoriasis with intramuscular and intravenous injections of salvarsan and with one exception have seen no encouraging results. The one exception had a most typical psoriatic eruption which responded beautifully to an intravenous injection, but to our dismay the laboratory report showed a positive Wassermann. On close questioning a vague history of syphilis was elicited. The three cases reported as cured may have been similar to this one.

*Relapsing Fever.*—One hundred and ninety-five cases received 0.2 and 0.3 gm. of salvarsan intravenously during the febrile stage. In the majority of the cases the organisms could not be demonstrated in the blood from four to ten hours after the injection, and the fever disappeared in from seven to fourteen hours. In none of the cases were relapses observed.

*Rhinoscleroma* (*Scleroma*).—Four cases have been reported in which the clinical picture remained unchanged after the patients had received a subcutaneous and an intramuscular injection.

*Scurvy* (*Scorbutus*).—Of ten patients treated, eight received repeated doses of 0.2 or 0.3 gm. of salvarsan until 1 gm. had been given. There was a rapid decline of symptoms and quick general improvement. In the other two cases the amount of salvarsan given is not recorded, but the results obtained were excellent.

*Sarcoma.*—Four patients received intratumoral injections. One patient received three injections and showed temporary improvement. In the other three cases there was no appreciable influence on the disease.

6. Cole, H. P., and Winthrop, G. J.: The Status of Salvarsan in Pellagra, Based on the Reports of Twenty-One Collected Cases, THE JOURNAL A. M. A., June 17, 1911, p. 1794.

Sticker, at a meeting of the Berlin Dermatological Society in February, 1911, exhibited a dog in which he had grafted sarcoma, which he subsequently destroyed with salvarsan.

*Scarlet Fever.*—Five cases, in some of which the prognosis was fatal, received injections, but without any effect. It would seem to me that salvarsan is a dangerous drug to use in scarlet fever. On account of the frequent kidney involvement, a dose of salvarsan might just be the factor in defunctionating the already damaged kidneys.

*Tuberculosis.*—Abulow[7] reported improvement following the administration of salvarsan in tuberculous patients; but the improvement was only temporary, no arrest of the disease being noted.

It was a similar initial improvement that first stimulated our attention to the possibilities of salvarsan in diseases other than syphilis. We have since made the same observations in other cases of tuberculosis, the results of our observations concurring precisely with Abulow's.

*Tuberculides.*—(These cases comprise three of papulonecrotic tuberculides, two of angiolupoid, two of lupus erythematosis, three of erythema induratum and three of lichen scrofulosorum).—The results obtained in these cases were various. Some showed quick and decided benefit, others showed improvement which may or may not be attributable to the salvarsan, and in some there was no response. The papulonecrotic tuberculides, angiolupoid and erythema induratum were the conditions that showed the most improvement.

*Trichinosis.*—At Kings County Hospital there were two cases simultaneously (husband and wife). Both received the usual purgative and supportive treatment. One received in addition 0.6 gm. of salvarsan. The course of the disease was not altered and both patients succumbed. At post-mortem the live trichinellae were demonstrable in the muscle-tissue.

*Trypanosomiasis.*—Of fifteen cases reported, eleven patients died (one immediately following the injection). One patient survived but was hemiplegic. One patient recovered and has had no symptoms for two years. Two patients received intraspinal injections of 10 c.c. of 1:100 solution of neosalvarsan, one of whom died after the first injection, and the other finally succumbed after the third.

*Ulcus Tropicum (Ulcus Phagedaenicum).*—Six patients have been treated with extremely favorable results. Three received intravenous injections, two intramuscular, and in one a 10 per cent. ointment was used. The intramuscular cases had been treated by various other methods for six months with no response, and in from seventeen to twenty-five days, respectively, the ulcers were healed. Two days after the intravenous injection improvement started and went on rapidly to a complete healing. The ointment healed the ulcers in ten days.

*Verrucae Planae.*—Four patients each received an intravenous injection of salvarsan. In one case the warts disappeared after a few days. In another case the lesions on the face disappeared by the sixth day, and on the hands by the nineteenth day. In the third case the lesions disappeared within a couple of weeks. In the fourth case the lesions disappeared, but there were recurrences.

7. Abulow: Russian Jour. Skin and Venereal Dis., July, 1912.

*Variola Vera.*—Three severe cases of small-pox were treated with two intravenous injections of 0.1 gm. of salvarsan. The patients improved generally and recovered without any complications.

*Vincent's Angina.*—Of eleven cases, seven were treated with local applications (two as a dusting-powder, and five suspended in glycerin), and four received intravenous injections. Both methods gave equally good results. In each case there was an immediate improvement and a rapid healing.

Besides these eleven cases Assmay and Kyritz[8] report salvarsan very effective in ulcerations that are due to the symbiotic action of Vincent's organisms.

### SUMMARY OF RESULTS

Viewing the situation from the results obtained, the diseases treated fall into one of three groups: first, those which were uninfluenced; second, those in which the results were indifferent, that is, showing different degrees of improvement in different cases of the same disease, or showing improvement or cure in some cases, with negative results in other cases of the same disease, and third, those in which a uniform improvement or cure was effected.

Group A. This group comprises bilharziasis, carcinoma, chancroid, erythema multiforme, Hodgkin's disease, psoriasis, rhinoscleroma, scarlet fever, sarcoma, trichinosis, trypanosomiasis.

There is nothing in the etiology, pathology or clinical manifestations of these diseases that would lead one to suppose that any response to salvarsan should be obtained. In those which are of bacterial or protozoan origin, the organisms by virtue of their protected location in the tissues are practically impregnable. With the exception of psoriasis, arsenic has never had a place in the treatment of any of them. In psoriasis, Fowler's solution in ascending doses has been used extensively, but with variable results; and apparently salvarsan, because of its more transient presence in the system, has not even the virtue of the other arsenical preparations in this very chronic condition. The mode of administration ought to be a factor in this and other chronic diseases. If small, often repeated, intramuscular injections be given over a long period, instead of one or two intramuscular or intravenous injections of 0.6 gm. at a monthly interval, more satisfactory results might be obtained. In Hodgkin's disease, it is a question how much absorption was obtained by the intratumoral injections; and since there is no parasite to be destroyed, it is difficult to say what benefit could be expected from this form of treatment. By small, intramuscular injections, judiciously repeated, one would be obtaining a more prolonged effect of the arsenic, thereby combating the anemia and probably giving the patient a longer lease of life.

Group B. This group may be divided into two subgroups, (1) those of supposedly non-parasitic, and (2) those of known parasitic origin.

1. Anemia, keratosis follicularis, lichen planus, mycosis fungoides pemphigus, pellagra, pityriasis rubra, and the tuberculides. Here are a group of diseases in which arsenic has always been recommended and extensively used but with no constant results; and we find that salvarsan affects them with the same irregularity. They are essentially diseases in which a

8. Assmay and Kyritz: Arch. f. Schiffs- u. Tropen-Hyg., 1913, No. 17.

depleted nervous system plays an important part either primarily or secondarily, and the good results that were obtained are due to the tonic, stimulating and alterative properties of the arsenic radical. In those cases which were influenced, the salvarsan seemed to act with more rapidity and decisiveness than other arsenic preparations.

2. Aleppo boil, leprosy, lupus vulgaris and tuberculosis. In these diseases salvarsan may have a certain germicidal effect on the invading organisms, but cannot reach them all on account of their more or less protected position in the tissues. It destroys such of them as it can reach and the disease is apparently improved or arrested, only to go on its regular course after the drug has been eliminated from the system. Here too must be admitted a certain tonic, stimulating and alterative effect from the arsenic. One cannot ignore the marked improvement, although only temporary, in leprosy. Salvarsan here is a valuable adjunct in its treatment. It should be used at intervals intravenously or intramuscularly, dependence being placed on chaulmoogra oil, nux vomica and tuberculin for the ultimate results. In fact, such a method has been carried out by us in one case with excellent results.

This patient, a Japanese and native of Singapore, was admitted to the hospital with his face covered with nodules varying in size from that of a lentil to that of a walnut. He was given chaulmoogra oil and nux vomica in rapidly increasing doses. The nodules resolved and the patient made steady improvement under this treatment. He left the hospital and after six months' absence returned with active signs of recurrence. Although the same treatment was instituted and the chaulmoogra oil increased up to 150 drops, no impression was made on the disease. He was then given 0.6 gm. of salvarsan by vein. The leprotic nodules became inflamed and he was very ill for a few days. Ten days later serial injections of old tuberculin were started, the patient receiving weekly injections. Three weeks later improvement was noted, which continued until at the end of six months all clinical symptoms had disappeared. Patient was seen April 16, 1914, ten months after dismissal from the hospital, and there was apparently no recurrence.

Undoubtedly the good results obtained in lupus vulgaris must be attributed to the tuberculin. Salvarsan here seems to be a valuable adjuvant, since cases treated by us with tuberculin alone have not responded so quickly or so completely as those receiving the combined method.

Group C. This group divides itself into two subgroups, according to a known or unknown etiologic factor.

1. Filariasis, frambesia, relapsing fever and Vincent's angina. In these diseases the causative factor in each is a spirillum, and it is here that the results obtained have been no less brilliant than those obtained in syphilis. In amebic dysentery, anthrax and malaria, the invading organisms are easy of access. Anthrax, if not primarily so, soon becomes a general infection, the bacillus invading the lymph and blood. Malaria is a blood infection, the parasites at one time in their life cycle occupying the red cells and at another time floating free in the blood. An intravenous injection of salvarsan would destroy these organisms "at one fell swoop," as it were. The amebas of dysentery are undoubtedly destroyed by the excretion of arsenic through the bowel, as well as by the germicidal action of the drug in the blood in the intestinal mucosa. The local stimulating effect causes a healing of the ulcers.

2. Acanthosis nigricans, chorea, Duhring's disease, scurvy, ulcus tropicum, variola and verrucae planae. This is a miscellaneous group in which the etiologic factors are obscure or unknown, and it is difficult to be exactly certain of the factors operative in bringing about the happy results obtained. As was before suggested, there was a suspicious scar present in the case of acanthosis nigricans. Darier thinks that the disease is due to the action of a malignant growth on the abdominal sympathetic. Assuming that a visceral gummatous infiltration might produce the same effect on the abdominal sympathetic as a malignant growth, the good result obtained in this case is readily understood, whereas the same disease caused by a malignant condition might not be influenced in the least. Since all other treatment has been unsatisfactory, salvarsan should be tried in every case and its status more definitely established. In chorea arsenic has been the sine qua non, and in salvarsan we have replaced the former preparations by one of far greater potency and celerity of action. The results obtained in Duhring's disease have not been equaled by any other form of treatment. The exhausted nervous system seen in most cases of this disease is undoubtedly the basis on which salvarsan produced its good results. The alterative properties of salvarsan in the cases of scurvy corrected the disturbed metabolism promptly. If, then, a proper diet is prescribed, there should be no recurrence of this condition. While variola is a general infection, the specific organism is contained chiefly in the cutaneous lesions. The blood-vessels show a distinct dilatation throughout the whole cutis, increasing the blood-supply to the lesions. If now salvarsan is introduced into the blood and brought to the lesions, a marked destruction of organisms must follow, thereby ameliorating the disease by lessening the toxic absorption from the less toxic lesions. In verruca and ulcus tropicum we shall have to be content with the knowledge that salvarsan has curative properties for both. In the latter condition, however, I believe that the future will disclose one of the various forms of spirillum as a causative factor, and as before stated, salvarsan has reached its highest efficiency in all forms of spirillum infection.

## CONCLUSIONS

From the foregoing study we are justified in formulating the following rules for the use of salvarsan in non-syphilitic diseases:

1. Salvarsan is specific in diseases caused by any variety of spirillum.

2. Salvarsan has curative properties in those diseases in which the infecting organisms are found in the blood or lymph, or in other locations where they can be easily reached.

3. Salvarsan has great therapeutic value in those diseases in which arsenic has been successfully used.

4. Salvarsan, if used with caution in repeated doses over a long period, has a therapeutic value in those diseases in which previously arsenic gave indifferent results.

5. Salvarsan, used as an adjuvant to some other drug or drugs, is useful in those diseases in which a decided and quick tonic, stimulating and alterative effect is desired, depending on the other drug or drugs for the ultimate result.

6. The mode of administration is important, and should be as follows: intravenous in those diseases in which a specific action is desired; full dose intra-

muscular injections repeated once or twice at long intervals (eight weeks), in those cases in which the tonic, stimulating and alterative effect is desired, as well as a certain specific action; small, oft-repeated (week or ten days) doses, intramuscularly, over a long period of time, in those chronic diseases in which a purely tonic, stimulating and alterative effect is desired.

1198 Bushwick Avenue.

## ABSTRACT OF DISCUSSION

DR. JOHN A. FORDYCE, New York: I have not used salvarsan systematically in non-syphilitic diseases, but I have seen its effects on the coincident diseases of syphilitic patients, and in a few instances I have used it for non-syphilitic conditions. I have never seen any effect from it in psoriasis. In a case of mycosis fungoides it was used systematically without apparent benefit, but subsequent Roentgen-ray treatment had an apparently marvelous effect on the eruption. In a case of filariasis it had no effect. In a case of chorea in a boy with endocarditis the chorea was temporarily benefited, but there was a relapse soon afterward. In lichen planus it was also used without result.

DR. JAMES M. WINFIELD, Brooklyn: I question whether salvarsan, aside from its simple tonic effect, has any value in tuberculosis. In the case of leprosy mentioned by Dr. Best the patient seemed to improve much more rapidly under the combined treatment of tuberculin with chaulmoogra oil and salvarsan. In another case we used tuberculin and salvarsan, and that patient recovered and remained well for a long time. In a case of elephantiasis and filariasis the patient made a complete recovery. In a case of Vincent's angina we used salvarsan without any effect. In connection with chorea the question always arises whether it is true chorea or a manifestation of inherited syphilis.

F. W. CREGOR, Indianapolis: The marvelous results attained from salvarsan in the control of syphilitic skin lesions, coupled with the reputation which arsenic has so long enjoyed in the treatment of various dermatoses, has suggested the use of salvarsan to the mind of many, even though the spirillum is not known or even suspected of being the cause of the disease in which it has been thought advisable to try the remedy. I treated one case of dermatitis herpetiformis for forty days, during the last thirty of which the patient was given a subcutaneous injection of sodium cacodylate, 3 grains daily, with only indifferent success. The patient was then lost sight of, and when she returned, three months later, there was an exacerbation of the eruption. She was then given a full dose of neosalvarsan, intravenously, and at the expiration of a week there was marked improvement. Following the second injection the case rapidly went on to complete recovery. Six months have now elapsed, and while perhaps on three occasions the patient has had a few discrete lesions, there has been no general exacerbation. Her improvement has been more marked under this treatment than under any other form of medication with which we are familiar.

DR. HOWARD FOX, New York: In a paper read before this Association at Los Angeles, Dr. William B. Trimble and I reported on our first one hundred cases of syphilis treated by salvarsan. In two of these cases there were also well-marked eruptions of psoriasis which cleared up in a most favorable manner after salvarsan injections. As a result of this experience, I later treated nine cases of psoriasis with one or two injections of salvarsan but failed to obtain any material improvement in any case.

DR. WILLIAM THOMAS CORLETT, Cleveland: A word of caution might well be given lest the general practitioner get too glowing an idea of the value of salvarsan in non-syphilitic diseases. I have given salvarsan to syphilitic patients who were suffering from various concomitant diseases without producing any effect on them. I have also given it in psoriasis and pemphigus foliaceus with negative results. The same was true in one case of Duhring's disease, while in one case of premycotic stage of mycosis fungoides the patient was given four intravenous injections of neosalvarsan with very marked improvement.

DR. WILLIAM H. BEST, Brooklyn: This treatment is still in its infancy, and we hope by further study and by changing the method of administration to get more constant results in those diseases included in Group B, which up to the present time have responded indifferently to salvarsan. As to the case of Vincent's angina, to which Dr. Winfield referred, there are ulcerative and necrotic conditions of the mouth and throat which are not due to the symbiotic action of Vincent's organisms, and Dr. Winfield's case may have been one of these. I am not advocating the use of salvarsan indiscriminately, but have tried to place the limits of its usefulness. In a number of diseases in which it has been used, I do not see how any results could be expected. These I have specifically named. It is gratifying to know, however, that in other diseases salvarsan has great therapeutic value. These diseases also I have specifically named. If the rules laid down for its use are conscientiously followed, I have no fear that the use of salvarsan will be an abuse.

# EXPERIMENTAL CHRONIC GASTRIC ULCER

### A SECOND CONTRIBUTION TO THE EXPERIMENTAL PATHOLOGY OF THE STOMACH*

J. C. FRIEDMAN, M.D.
AND
W. W. HAMBURGER, M.D.
CHICAGO

It is comparatively easy to produce experimentally acute ulcers in animals, and as far as gross and microscopic examinations go they resemble the same conditions in man. Common to all ulcers so produced, however, is the fact that they heal rapidly, healing being complete in the great majority of cases in from two to three weeks. In the human chronic ulcer, however, hyperacidity is present in at least half the cases, and it seemed to us, then, that if we added this factor to experimental acute ulcer, chronicity might be induced. Furthermore, it is a well-known clinical fact that stomachs with partial pyloric obstruction generally show hyperacidity, or, what is probably synonymous, hypersecretion; consequently we might induce hyperacidity experimentally by partially obstructing the pylorus and later in the same animals cause acute ulcers. To this end we tied a heavy silk ligature around the pylorus of dogs, just tight enough to produce moderate tension and marked peristalsis and antiperistalsis. We found that if just the right amount of tension is used, such stomachs will show marked dilatation and hypertrophy in from two to three weeks. If the ligature is tied more loosely, no effect is produced; if it is tied more tightly, complete pyloric obstruction results, with sudden exitus in from forty-eight to seventy-two hours, and symptoms at times resembling tetany. In animals successfully operated on, test meals from two to three weeks later show both stasis and hyperacidity.[1]

The test meals employed consisted of 300 c.c. milk and 100 gm. chopped beef, the latter fed, the former introduced through a stomach-tube. Fifty minutes later 1/20 grain apomorphin was given hypodermically, and the vomitus caught in a vessel, measured and

* Read before the Section on Pathology and Physiology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

† From the Nelson Morris Memorial Institute for Medical Research.

‡ Experimental Pyloric Stenosis, the first article of this series, will be published in the Archives of Internal Medicine.

1. Dr. Hamburger will report elsewhere in detail on these and allied phases of our work.

examined in the usual way. As far as possible, the test meals were given the dogs before and after each operative procedure.

The next step after producing a partial obstruction was to produce acute ulcers in these stomachs. This is comparatively easy, any number of methods having been previously successfully employed, and as far as the present work is concerned, any one of them might have been used. In general, the methods used have paralleled the clinical theories as to the etiology of ulcer, and may be divided broadly into (*a*) infectious, (*b*) toxic, both local and general, and (*c*) mechanical.

By infectious methods (*a*), acute ulcers have been produced by injecting various bacteria intravenously, such as streptococci, staphylococci, the *Bacillus coli*, pneumococci, etc., and by feeding bacteria. The toxic methods (*b*) have been either general, such as those observed by injecting diphtheria antitoxin, or local by injecting silver nitrate, epinephrin, liquor formaldehyd, nicotin, etc., into the walls of the stomach. The mechanical methods (*c*) include excising pieces of mucosa, tying off gastric arteries, and injecting various emulsions into gastric vessels. We selected the injection of silver nitrate into the submucosa as the surest method, using from 0.5 to 1 c.c. of a 5 per cent. solution. Each animal was injected in two or three places at the final operation, one injection being made near the pylorus, one near the middle of the lesser curvature, and one in the fundus.

These injections produce necrosis of the wall, and in from forty-eight to seventy-two hours the slough separates, being rapidly digested, and leaving ulcerated areas of varying depths and breadths, sometimes with smooth edges, as in Figure 1 *A*, sometimes with ragged edges, as in Figure 1 *B*. Perforations are frequent, hemorrhages much more seldom. Such ulcers, if produced in normal stomachs, heal in from two to three weeks. To return to the results of partial pyloric obstruction: These are shown in Tables 1 and 2, the first including cases in which post-mortems were done three weeks or more after the second operation, and unhealed ulcers found, the second, cases in which they had completely healed.

Of sixteen animals successfully operated on, the average total acidity before pyloric obstruction was 34, the average of all our animals being 30, the average, from three to four weeks after such obstruction, 50. Such increase, however, was not necessarily permanent, as in some cases, four weeks or so later, the acidity had dropped again, as in Case 51, Table 2, in which it dropped from 54 to 30, and in Case 42, Table 2, from 55 to 36. Another point is the total quantity of stomach-contents removed. This quantity varied in normal animals from 100 to 350 c.c., averaging about 200 c.c. After successful obstruction operations, the amount rose to various heights up to 1,000 c.c., and in general it can be seen from the tables that hyperacidity is present only in those cases in which the total contents are excessive, and, furthermore, that in some cases in which the total quantity of stomach-contents rose, the acidity rose with it. So in Case 41, Table 2, in which the total contents rose from 200 to 425 c.c.,

Fig. 1.—Acute ulcers, eight days after second operation.

TABLE 1.—CHRONIC ULCERS

| Case No. | Duration of Ulcer, Weeks | Stomach Contents: Acidity after First Operation | Stomach Contents: Acidity after Second Operation | Stomach Contents: Quantity after First Operation, c.c. | Stomach Contents: Quantity after Second Operation, c.c. | Condition of Stomach at Necropsy | Ulcers |
|---|---|---|---|---|---|---|---|
| 48 | 5½ | 26 | 50 | 450 | 550 | Moderate dilatation, great hypertrophy. | Two chronic pyloric ulcers. Two spontaneous duodenal ulcers. |
| 35 | 9½ | .. | 38 | ... | 150 | Small, slight hypertrophy. | Two small healing ulcers. |
| 36 | 7½ | .. | 26 | ... | 350 | Slight dilatation. | Small chronic pyloric ulcer. |
| 37 | 8 | .. | 50 | ... | 350 | Great dilatation. | Deep pyloric ulcer, 10 by 12 mm. |
| 43 | 6½ | 25 | 36 | 400 | 200 | Slight dilatation, great hypertrophy. | Chronic pyloric ulcer, 6 by 15 mm. |
| 22 | 3 | .. | .. | ... | ... | Great dilatation. | Chronic pyloric ulcer, 2 by 1 cm. |
| 5 | 6 | 23 | .. | ... | ... | Great dilatation. | Healing ulcer, lesser curvature, 4 by 4 mm. Chronic pyloric ulcer. |
| 55 | 7 | 52 | 42 | 950 | 1,050 | Great dilatation. | Small chronic pyloric ulcer, .05 by 1 cm. |
| 30 | 4½ | 75 | 64 | 300 | 250 | Great dilatation and hypertrophy. | Superficial pyloric ulcer, 1 by 1 cm. |

the acidity rising from 37 to 52 during this period, and in the cases mentioned above, Cases 51 and 42, Table 2, in which the acidity dropped to normal, the total quantities dropped also. The coincident variations of these two factors point to some relation between them,

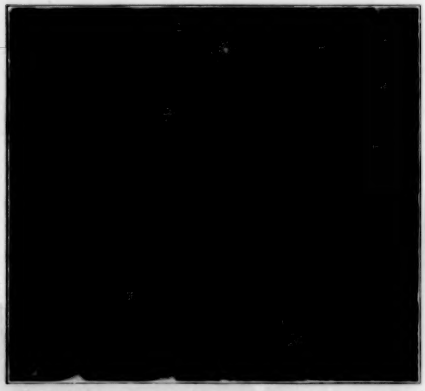


Fig. 2.—Chronic ulcer (delayed healing), three weeks after second operation.

probably an identity. As stated at the outset, then, hyperacidity is probably simply a hypersecretion, and in many cases is dependent on impaired motility. We hope in the near future to work at this problem.

To come now to the main problem, a comparison of these two tables shows the following facts:

In every case of Table 1 there was marked impairment of motility, as measured by the total quantity of stomach-contents recovered after test meals, and by the condition of the stomach found postmortem as to hypertrophy and dilatation. In each case a notation was made at necropsy, "greatly dilated," or at least "greatly hypertrophied," while only one case in seven of Table 2 (namely, of healed ulcers), was greatly dilated. The acidities varied, as stated above, and again it was in those cases in which the motility was most impaired, as measured by total stomach-contents and post-mortem dilatation, and the hyperacidity most pronounced, that the chronicity of the ulcer was most marked. So in Cases 48, 37, 22, 5, 55 and 50 (Table 1), from which our best specimens were obtained, the dilatation was very marked and the acidity high.

The types of ulcers which we have so produced can be divided into three classes: First, those which are apparently acute ulcers, in which healing is simply delayed. They have a puckered appearance, as though scar formation were slowly progressing (Fig. 2). These are similar to the ones described by Bolton,[1] who partially obstructed the pylorus in cats and considered this the only type so obtainable. Second, typical chronic ulcers, probably stationary, with rounded, overhanging edges and smooth fibrous bases (Fig. 3). Third, progressive chronic ulcers, as in Figure 4, in which the induration is not marked, but the evidences of autodigestion are evident, as indicated by the terracing at one end and the deep undermining at the other. No typical callous ulcers were found, the nearest approach being the one shown in Figure 5, in which the induration is limited to the base, which consists of excess of granulation tissue.

In two cases spontaneous duodenal ulcers were found at necropsy, just beyond the pylorus. In one case the thickened mucosa showed superficial ulceration. In the second case, Case 48, two typical round

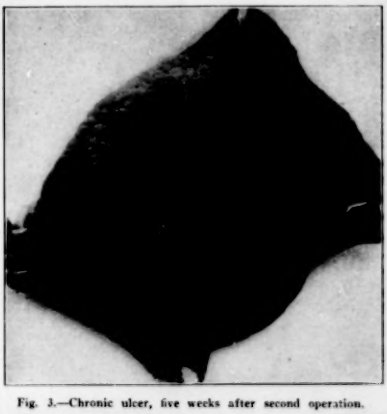


Fig. 3.—Chronic ulcer, five weeks after second operation.

ulcers were present, one of which had perforated and caused peritonitis. These cases will be reported on later.

1. Bolton: Further Observations on the Pathology of Gastric Ulcer, Proc. Roy. Soc., 1909-1910, lxxxii, B.

TABLE 2.—HEALED ULCERS

| Case No. | Duration of Ulcer, Weeks | Stomach Contents: Acidity after First Operation | Stomach Contents: Acidity after Second Operation | Stomach Contents: Quantity after First Operation, c.c. | Stomach Contents: Quantity after Second Operation, c.c. | Condition of Stomach at Necropsy | Ulcers |
|---|---|---|---|---|---|---|---|
| 38 | 7 | 26 | 36 | ... | 550 | Moderate dilatation. | None. |
| 41 | 7½ | 37 | 52 | 200 | 425 | Small. | None. |
| 51 | 4½ | 54 | 30 | 350 | 200 | Small. | None. |
| 39 | 7 | .. | 62 | ... | 800 | Great dilatation. | None. |
| 42 | 3 | 55 | 36 | 250 | 325 | Slight dilatation. | None. |
| 26 | 2 | .. | .. | ... | ... | Small. | One acute pyloric ulcer. One acute ulcer lesser curvature. |
| 28 | 3 | .. | .. | ... | ... | Small. | Two healing ulcers. |

It will be remembered that each animal was injected with silver nitrate at the second operation in two or three different places, near the pylorus, lesser curvature and fundus. By reference to Table 1, it will be seen that in the majority of cases the pyloric ulcer alone remained unhealed, or in the cases in which two remained, the one near the pylorus was much larger in every way than the other. This is quite in accord with statistics in man, for instance, Fenwick's who states that acute ulcers are multiple in 50 per cent. of the cases, and situated irregularly throughout the stomach, while chronic ulcers are single in 80 per cent. of the cases, and situated near the pylorus in 75 per cent.

The simplest interpretation of these facts would be as follows: Acute ulcers tend to remain unhealed when exposed to the action of a very active gastric juice for an abnormally long period, and possibly the delay in healing is greater if the food and gastric juice are ground against the ulcers with unusual violence from hyperperistalsis. Consequently, at least three factors are necessary for the production of chronic ulcers in animals: first, a local destruction of the mucosa; second, an active or overactive gastric juice and third, prolonged or vigorous contact of the two (hyperperistalsis). This combination of chemical and mechanical factors results in either irritation of the floor and sides of the ulcers, with increased production of scar tissue, whence the callous ulcer, or further digestion of this inflamed, and, therefore, less resistant tissue, whence the progressive chronic ulcer and all its sequelae.

Such an interpretation accounts for the healing of ulcers of the fundus. Two factors are concerned in this. The first is the difference in peristaltic activity between the fundus and the antrum, the former acting simply as a reservoir in which the food is not thoroughly mixed with gastric secretion and from which the contents are slowly pressed out into the active right half of the stomach.[2] Secondly, it has been repeatedly demonstrated that food in the fundus is only faintly acid, or even alkaline, while always strongly acid in the antrum of the normal stomach, that is, the gastric juice is practically inert in the fundus, so that from this fact also fundal ulcers tend to heal.

To apply these facts to ulcer in man: As to the first factor, we need only say that normal mucosa is, of course, not digested, and that the tissue must first be injured in some way—whether by bacterial emboli, by toxic products, as in burns or uremia, by trauma, or by any of the processes which cause gastritis. As to the second factor, we have used the term "an active gastric juice" advisedly because there is no reason why chronic ulcers should not be produced by normally acid juice acting on diseased tissue, if the other factors are present, and such is the fact in some of the cases of our series, as in Cases 36 and 43 of Table 1, and, of course, in over 40 per cent. of clinical cases. In describing the third factor, we spoke of prolonged or vigorous contact, or both, because we can readily see why an abnormally vigorous peristalsis, even acting for a normal period, should produce the same results as a less active for a longer period. Of course, in our work the peristalsis is both exceedingly vigorous and prolonged, as we demonstrated fluoroscopically in a number of our cases. Clinically, such prolonged contact is certainly present in a majority of the cases of ulcer of the stomach. For instance, Smithies[3] reports on 404 cases of ulcer of the stomach verified at operation, in 65.3 per cent. of which there was definite abnormal food retention. The abnormally vigorous contact as a furtherance to autodigestion is supplied, first, by the hyperperistalsis due to pylorospasm, which is seen fluoroscopically not infrequently in injuries to the mucosa anywhere in the gastro-intestinal tract, and, secondly, by the hour-glass contraction (also spasmodic) found by Barclay,[4] also fluoroscopically, in

Fig. 4.—Chronic ulcers, five and one-half weeks after second operation; progressive.

ulcer of the body of the stomach in 90 per cent. of the cases. This spasmodic narrowing would, of course, increase the friction of the food particles. That such friction plays some part in human ulcer is shown by Stromeyer's[5] studies on the typical funnel shape of ulcer, with the proximal end deeper and the mucosa undermined, the distal end being shallowed and terraced, a fact which he explains by the progression of the stomach contents toward the pylorus, and its glacier-like, eroding (that is, digestive) action. This we found in a number of our ulcers, as in Figure 5 *A*, an ulcer of five and one-half weeks' duration, situated 4 cm. from the pylorus, in which one end was quite deep, with undermined mucosa, toward the pylorus. The shallowed and terraced end was nearer the cardia, the opposite of Stromeyer's statement, to be sure, but natural when we remember that the progression of food in the antrum is not in an uninterrupted straight line toward the pylorus, but oscillatory first in one direc-

2. Cannon: The Mechanical Factors of Digestion, p. 69.

3. Smithies: Gastric Ulcer without Food Retention, Am. Jour. Med. Sc., March, 1913, p. 340.

4. Barclay: The Stomach and Esophagus: A Radiographic Study.

5. Stromeyer: Die Pathogenese des Ulcus Ventriculi, Beitr. z. path. Anat. u. z. allg. Path. (Ziegler's), liv, 1912, No. 1.

tion, then in the other, and that, therefore, the undermining by digestion may occur at either end.

As a working hypothesis consistent with these experimental data, we may suppose either that acute ulcerations arise in the stomach from some outside cause and result reflexly in a pylorospasm, which again causes impaired motility, hypersecretion and hyperperistalsis, thus inducing chronicity; or that various conditions in the gastro-intestinal tract, as septic conditions in the mouth, mucous colitis, appendicitis, cholecystitis, etc., reflexly cause spastic contractions of various parts of the stomach, and narrowing of the lumen. If an abrasion occurs at the narrowed portion, for instance, from a coarse particle of food, the same process of digestion causes chronicity and the ulcer then perpetuates the spasm; or, more broadly, those persons whom we formerly termed neurasthenics, but who are now classed as vagotonics, may have pyloro-

Fig. 5.—Chronic ulcer; markedly indurated base eight weeks after second operation.

spasms from reflex causes in any part of the nervous system, and so the chain of events be set in motion (Barclay,[4] von Bergmann[6]).

## SUMMARY

1. In the dog, chronic ulcers may arise from acute ulcerations, if certain factors are present, namely, prolonged and probably violent action of active gastric juice, that is, hypersecretion and hyperperistalsis, and that such ulcers may remain unhealed if the acidity later drops to normal. Other factors, such as anemia, absence of anti-pepsin, vascular obstruction, etc., are unnecessary presuppositions.

2. Stromeyer's theory of the digestive action of the gastric juice and the progress of food particles as determining the typical shape of ulcers is probably correct.

3. The majority of chronic ulcers are single and situated near the pylorus, because ulcers elsewhere tend to heal, the factors causing chronicity being usually present only near the pylorus.

29 East Madison Street—104 South Michigan Avenue.

6. Von Bergmann: Das spasmogene Ulcus Pepticum, München. med. Wchnschr., 1913, No. 4.

## ABSTRACT OF DISCUSSION

Prof. A. J. Carlson, Chicago: I observed a couple of years ago that about 75 per cent. of the dogs in which experimental parathyroid tetany had been produced showed certain types of ulcers in the duodenum and the pyloric mucosa. I thought at that time it indicated some relation between the parathyroids and these ulcers, as has been suggested by one of the previous speakers with reference to the internal secretions in general, but in extending the observations to cats I was quickly disabused of that premature conclusion in that I have never observed that phenomenon in cats in parathyroid tetany. I am inclined to believe that, of all the experimental animals, the dog is the one most prone to develop ulcers in the duodenum and in the pylorus without direct experimental interference that will tend to produce such ulcers. I do not mean by this to throw any doubt on the actual facts so beautifully shown by Dr. Rosenow with his streptococci injection or those reported by Dr. Friedman here to-day, but conclusions as regards the connection between the internal secretions and duodenal ulcers cannot be based on experiments on dogs alone.

Dr. E. C. Rosenow, Chicago: How long were these ulcers observed and were any cultures made from the depths of the ulcers which were produced experimentally? The results show clearly that obstruction of the pylorus in dogs delays the healing of ulcers produced by injections of silver nitrate and emphasize the rôle which obstruction undoubtedly plays in delaying healing of some ulcers in man; but why might not this be due to secondary infection of the walls of the ulcer made possible by rather than due directly to the interference with the function of the stomach? This it seems to me is a possibility which must be considered in view of the fact that the ulcers which I have produced by intravenous injections of streptococci from various sources, but of a particular grade of virulence and commonly with streptococci isolated from the depths of typical chronic indurated ulcers of the stomach and duodenum in man, tend to persist for a long time, occur most often in the pyloric end or duodenum, become indurated, may perforate or produce fatal hemorrhage and yield streptococci often in pure form as long as fourteen weeks after a single injection. Moreover, persistence of ulcers in man is not so uncommon when little or no disturbance of motor or secretory functions of the stomach can be made out.

Dr. J. C. Friedman, Chicago: First, as to Dr. Rosenow's question, the oldest chronic ulcer that I have is of ten weeks' duration. Of course, it is difficult to keep the dogs alive for a much longer period in a closed space. They get mangy and die spontaneously if we don't kill them. Secondly, we didn't make any cultures because we did not think that this was an etiologic factor in our ulcers. The reason why in cats one cannot produce ulcers as easily as in dogs may be connected with the different varieties of food that they eat. Surely, in the human, hyperacidity is present in the majority of cases of ulcer. Statistics show that hyperacidity is found in from 50 to 60 per cent. of the cases, and when we work experimentally we must take this functional change into consideration, and it may be that in Dr. Carlson's work these cats did not have any hyperacidity, while the dogs in the same experiments did. Therefore, the ulcers healed in the one and did not heal in the other. Now it is a known fact that one can produce acute ulcers in dogs and it is equally certain that in two or three weeks these ulcers heal and that therefore there must be some different etiologic factor in the ulcers which do not heal. As far as cutting out the suprarenal is concerned, not only do we destroy the internal secretions of that organ, but we also cause a vast change in the sympathetic system. Now it may be that the changes in the sympathetic system caused the ulcers without aid from the internal secretions.

**Successful Medical Inspection.**—The success of the work of medical inspection is judged by the reduction of the number of cases of contagious diseases and the number of physical defects corrected.—E. A. Montague in *Northwest Med.*

# ADENOMYOMA OF THE RECTOVAGINAL SEPTUM*

D. S. D. JESSUP, M.D.

Pathologist to the New York Skin and Cancer Hospital, and Archer Brown Research Fellow

NEW YORK

Prior to the publication, in February, 1913, of reports of Cuthbert Lockyer's cases of adenomyoma of the rectovaginal septum,[1] the occurrence of such growths in this region had apparently not been observed either by surgeons or by pathologists.

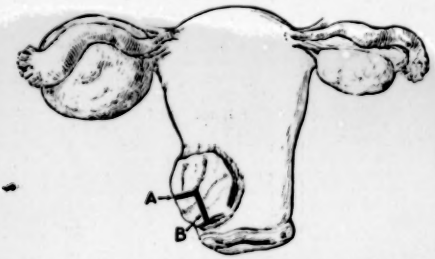



Fig. 1.—Adenomyoma of the rectovaginal septum, Case 1. A diagrammatic representation of the relation of the rectal tumor to the posterior uterine wall. Horizontal section taken at *A* is shown in Figures 2 and 3.

During the month of January, 1913, during which month Lockyer reported his cases, there were sent to me for diagnosis two rectovaginal tumors in which complete hysterectomy had been done. These proved to be counterparts of Lockyer's cases. It is through

Fig. 2.—Adenomyoma of the rectovaginal septum, Case 1. Low-power view taken at *A*, Figure 1. At *R* is seen normal rectal mucosa. At *G* is an enlarged gland showing hemorrhage and exfoliation of epithelium into lumen. At *T* is a blocked-out area of glands and stroma shown in Figure 3.

the courtesy of Dr. William S. Bainbridge, who operated on the patients, that I have the opportunity of reporting the cases.

* Read before the Section on Pathology and Physiology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

* From the Research Department of the New York Skin and Cancer Hospital.

1. Lockyer, Cuthbert: Proc. Roy. Soc. Med., 1913, vi, No. 4.

CASE 1.—Mrs. D., aged 36, was married but had had no children. There was no history of syphilis. One year previously she had been operated on for extra-uterine pregnancy. One small fibroid and the appendix were removed at this time. Menstruation had been regular up to three years ago, when she began to have dysmenorrhea and irregular flow. The present illness began two years ago with a gradual onset. The chief complaint was excessive menstruation, vaginal discharge and pain in the lower part of the abdomen. There had been loss of weight. Examination on admission

Fig. 3.—Adenomyoma of the rectovaginal septum, Case 1. High-power view of blocked-out area *T*, Figure 2. This shows islands of mucosa with the glands and stroma characteristic of uterine mucosa.

to the hospital showed a mass between the uterus and rectum and attached to each. The uterus was enlarged and attached to the bladder and rectum. Cervix was ulcerated. The diagnosis was made of a "precancerous" uterus with probable malignant mass in culdesac.

Operation was performed, Jan. 9, 1913. Many pelvic adhesions were found. Complete hysterectomy was done with removal of pelvic lymph-nodes and ligation of the right internal iliac artery. In the culdesac a bridge of carcinoma-like tissue was found extending from the vesicovaginal junction posteriorly to the rectum and so blended with the latter that a partial excision of the wall of the rectum was necessary. The patient made an uneventful recovery, going home in four weeks and has been well ever since.

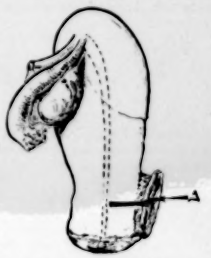



Fig. 4.—Adenomyoma of the rectovaginal septum, Case 2. A diagrammatic representation of the relation of the rectal tumor to the posterior wall of cervix. Horizontal sections taken at *A* are shown in Figures 5, 6 and 7.

Pathologic Report 2018: The tissues consist of the uterus, tubes and ovaries, portion of the rectum and pelvic nodes. The uterus is 8 cm. long and 6 by 5 cm. at fundus. The ovaries are enlarged and cystic, the largest 5 cm. in diameter. The uterine wall shows a fibroid 2 cm. in diameter. To the lower portion of the posterior wall of the uterus there is attached by a band of fibrous tissue a section of rectal mucous membrane measuring 3 by 2 cm. (Fig. 1). The rectal mucosa appears normal, but the tissue between it and the cervix is dense, and cuts like a fibroid.

Microscopic examination of the sections of the uterine body and cervix fails to show any malignant new growth. There

is a chronic cervicitis and the pelvic nodes show chronic inflammatory changes. A horizontal section through the rectal tumor (Fig. 2) shows normal rectal glands and stroma and beneath this a broad zone of non-striated muscle. Scattered through the muscl. are glands occurring singly or in groups, some lying within 1 mm. of the rectal mucosa. They

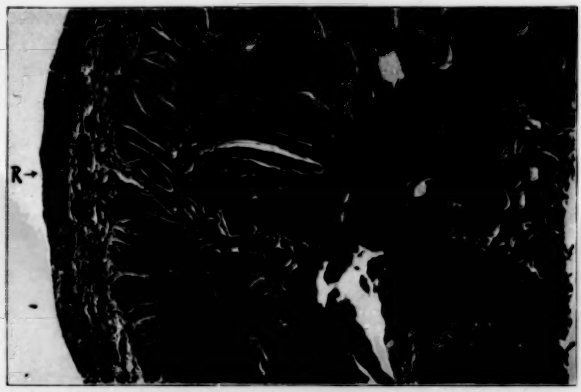



Fig. 5.—Adenomyoma of the rectovaginal septum, Case 2. Low-power photograph showing normal rectal mucosa at letter *R*. Beneath this is a growth of smooth muscle at *M*, with a few scattered glands at *G*, and a large group of them at *T*.

are surrounded by a stroma of small round and oval cells. This stroma is more in evidence where there are several glands together. Some of the glands are enlarged or cystic and contain blood-cells and exfoliated epithelium, the result of hemorrhages into them. The epithelial cells lining the glands are cylindrical, and cilia can be demonstrated on the surface of some. The glands resemble those of the uterine mucosa rather than those of the rectum.

Case 2.—Mrs. F., aged 40, married, has two children, aged 17 and 13. She has never been seriously ill. The movements of the bowels have been irregular until three months ago when they became regular. She does not know what brought about the change. Ever since marriage there has been pain on the left side low down in the region of the ovary. This pain comes and goes without relation to the menstrual periods. Hemorrhoids have given her trouble for the past thirteen years and recently there has been bleeding from the rectum. Physical examination showed external and internal hemorrhoids, tenderness over the appendix and a large uterus with a lacerated cervix. A distinct hard mass was felt in the culdesac of Douglas, beginning to adhere to rectum. It was thought to be a uterine fibroid. Examination of this mass from the rectal side with a proctoscope showed an intact rectal mucosa but one which bled readily at the site of the tumor.

Jan. 21, 1913, hysterectomy was performed with removal of the tubes and ovaries and appendix and a portion of the rectum. It was found that between the uterus and the rectum attaching together their peritoneum and muscular coats was a nodule ¾ inch in diameter with contracted tissue around it strongly suggesting malignancy. It was necessary to excise a piece of rectum to remove the growth.

Pathologic Report 2042: The uterus is 9 cm. long and 5 by 4 cm. at fundus. The wall is 2 cm. thick and the mucosa roughened. Both ovaries are cystic and enlarged. Tubes are thickened at fimbriated end and adherent to ovaries. There is a small area of rectal wall attached posteriorly to uterus by a band of fibrous tissue (Fig. 4). On section there is a hard fibrous base from 0.5 to 1 cm. deep lying beneath rectal mucosa.

Microscopic examination of sections of the uterus shows a chronic cervicitis. There are moderate inflammatory changes in the tubes and appendix. Rectal mass: sections were cut horizontally through from the rectum to within 0.5 cm. of the canal of the cervix (Figs. 5 and 6). Here as in Case 1, the rectal mucosa is normal. Beneath it is a growth of smooth muscle which extends through and is continuous with that of the cervix. Glands appear within 2 mm. of the rectal epithelium. They occur singly at first with very little stroma, but further in there is grouping of large numbers of them and at a depth of 1 cm. they form a nodule from 1 to 1.5 cm. in size. The epithelial lining cells are cylindrical and of the uterine type and cilia can be demonstrated. Between this group of glands and the cervical mucosa there is a distance of 2 cm. in which no glands can be seen. There is not so much cystic dilatation of the glands as in Case 1, but some show blood and detached epithelium as evidence of hemorrhage (Fig. 7).

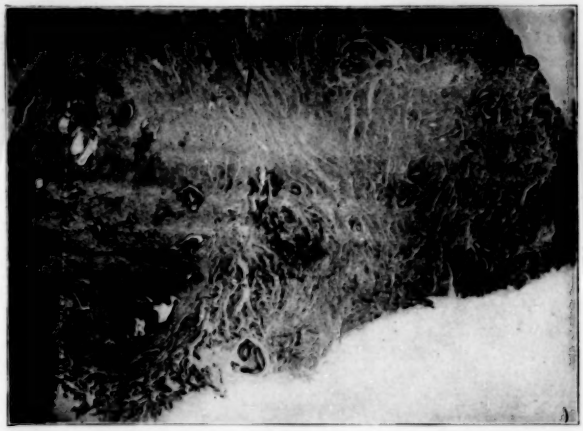



Fig. 6.—Adenomyoma of the rectovaginal septum, Case 2. Low-power view continuation of mass of glands and stroma seen at letter *T*, in Figure 5, and indicated here also by letter *T*. Blocked-out rectangular area is shown in the high-power view of Figure 7. Letter *C* is at the uterine edge of section at a point 0.5 cm. from the cervical canal.

## DIAGNOSIS

These two cases presenting the same picture clinically and pathologically can be considered together

from the point of view of diagnosis. While the microscopic picture was identical with that of cases of adenomyoma of the uterus which we had previously seen, the unusual location and the absence, at that time, of any records of such cases in the literature, led us to ask the opinion of Dr. Thomas S. Cullen, who on account of his well-known book[2] and other publications on the subject of adenomyomas, would be in a position to confirm our diagnosis if correct. Dr. Cullen very kindly examined the slides that I mailed him and wrote me very fully his opinion of the cases. Since then he has published reports of two cases of his own with a review and discussion of Lockyer's cases.[3] I cannot do better than quote a portion of Dr. Cullen's views with regard to our cases. He writes:

> There is not a shadow of a doubt but that we are dealing with adenomyoma of the uterus in both cases. From what I can gather the growth is undoubtedly of the uterine type and not of the rectal and the fact that the rectal mucosa is perfectly normal and in no way encroached on also favors the idea of the uterine origin. Furthermore, if we are dealing with an adenomyoma of the rectum then we should

Fig. 7.—Adenomyoma of the rectovaginal septum, Case 2. High-power photograph of blocked-out area seen in Figure 6. Compare with the high-power view of the glands and stroma of Case 1, shown in Figure 3.

expect the glands scattered throughout the tumor to consist of rectal glands and not uterine. Both of these growths are essentially adenomyomas of the uterus and they have undoubtedly involved the rectum secondarily. As you know, a certain number of these adenomyomas are particularly prone to form adhesions. This would naturally be more frequent in the cervical portion because the uterus there lies in close contact with the rectum.

From the point of view of clinical diagnosis these tumors are of interest. Dr. Cullen has shown that some adenomyomas can be diagnosed by their increase in size at the menstrual period with accompanying pain and discomfort. This is doubtless due to congestion and hemorrhage such as is shown in our cases in which the glands contain blood-cells and epithelium. Examination of the histories, however, does not show that discomfort or pain if present was marked enough to be noted by the patients.

These tumors, while benign, have on physical examination the characteristic feeling of malignant growths on account of their density and tendency to form adhesions, and in both of our cases other surgeons had previously examined the patients and pronounced their condition inoperable on account of the apparent involvement of the rectum by a malignant growth.

That they may occur should be recognized by the surgeon, as the diagnosis can be made microscopically by a preliminary section. A simple excision of the mass would then cure the patient and there would be avoided the more serious operation of hysterectomy which would have been indicated if clinical diagnosis alone were relied on.

601 West One Hundred and Thirteenth Street.

2. Cullen, Thomas S.: Adenomyoma of the Uterus, Philadelphia, W. B. Saunders Company, 1908.
3. Cullen, Thomas S.: Adenomyoma of the Rectovaginal Septum, THE JOURNAL A. M. A., March 14, 1914, p. 835.

---

## A FEW PRACTICAL POINTS ON THE TREATMENT OF LEG-ULCERS*

A. RAVOGLI, M.D.
CINCINNATI

The ulcers of the legs, especially of the ankles, which are so frequently encountered in working-people, are of great interest on account of the difficulty of healing them. One of the characteristics of an ulcer is an open surface showing infiltration and necrotic process with no tendency to heal. The superficial molecular necrosis, or the disintegration of the connective tissues of the skin injured by long-standing infiltration, is the cause of the stubbornness of the ulcer. This molecular necrotic process is gradually produced, but sometimes is really a gangrene and the tissues are affected *en masse*.

In most of the cases the molecular necrosis is revealed by a yellowish coat on the ulcerated surface. As Kaposi[1] wrote, an ulcer is not a primary affection, but a secondary one, because it requires always a precedent inflammatory or neoplastic process, which has caused the molecular necrosis of the tissues and in consequence the prevention of healing.

Bell's classification[2] of ulcers as local or due to local causes, and symptomatic, due to constitutional systemic vice, still holds good. Yet considering the multiplicity of the causes which may act in one case in the production and continuation of the ulcer, we shall see that it is very difficult to accept this classification. In the production of the common ulcer resulting from varicose veins we may find traumatism, infection, phlebitis, periphlebitis, edema, eczema, all at the same time, as factors.

The division of ulcers into specific and non-specific is of great value in establishing the direct cause of their formation and maintenance. The ulcers which are known as constitutional may have syphilis or tuberculosis as their etiologic factor. Syphilitic gummas of the legs, when broken down, cause ulcers which are stubborn and difficult to cure. As Jadassohn[3] says, tuberculous ulcers of hematogenous origin are often localized in the legs, resulting from patches of erythema induratum. They have no indurated borders, and are of a peculiar bluish-red color. Tuberculous

* Read before the Section on Dermatology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Kaposi: Pathologie et traitement des maladies de la peau, Paris, 1891, p. 702.
2. Bell: Treatise on Ulcer, Edinburgh, 1778.
3. Jadassohn: Die Tuberkulose der Haut—Handbuch der Hautkrankheiten, Mracek, 1907, p. 251.

ulcers may also develop from cold abscesses in the legs, which, breaking down, cause ulcers.

In our cases of common ulcers we see that traumatism, constant irritation, mechanical pressure, chemical, bacterial, dynamic, electrical action, all combined, may produce infiltration, which causes molecular disintegration of the tissues with the resulting ulcer.

In many cases the ulcer of the leg is caused by the occupation. It is often found in workingmen who are compelled to remain standing for many hours. On account of the vertical position the blood does not circulate easily; it remains stagnant in the veins, which become turgid and are seen superficially as bluish streaks under the thickened skin. This interference with the circulation often causes phlebitis; the tunics of the veins are infiltrated and broken, forming bluish dilatations or varicosities. The standing position renders more difficult the return of the blood which remains in the dilated veins. It causes a passive stasis, and as a result the lymph-vessels are involved, hindering the progress of the lymph. This causes an exudation to take place from the lymphatics; some coloring-matter of the blood, or even some blood escapes from the weakened tunics of the veins, causing edema, and a thickening of the derma and of the subcutaneous tissues (Fig. 1). It is not limited to the derma and subcutaneous connective tissues, but in some cases the infiltration goes deep to the fasciae and at times involves even the muscles.

Fig. 1.—Infiltration of skin with edema from specific phlebitis.

Fig. 2.—Ulcus cruris from phlebitis with intramuscular abscess.

The relation of the ulcer to varicose veins is yet a matter of dispute for the reason that many persons having varicosities do not suffer from ulcers. These considerations have prompted many authors to look for other causes.

Schreider[4] attributed the varicose veins and the leg ulcers to gouty diathesis, Quenu[5] and Silvy[6] to a neuritis secondary to the varicose veins as a trophoneurotic disturbance. As Douglas[7] says, however, it is easy to see the strict relation between varicose veins and the ulcer of the leg in phlebitis. Phlebitis and periphlebitis, in either the large or the small veins, in a thickened, hard and infiltrated skin is liable to produce abscesses (Fig. 2) which break down and form the starting-point of the ulcer. When the ulcer has been formed in a skin which has ceased to react, in persons usually neglectful of cleanliness, it will be a nest of bacteria, and a continuous source of infection. In my observations I have found, ordinarily, staphylococci, only rarely streptococci. The introduction of the streptococci in the lymph-spaces of the derma and in the lymph-vessels causes extensive erysipelas and cellulitis, which recurring leave a thickened skin and hard edema with swelling of the tissues, which often ends in elephantiasis (Fig. 3).

The possibility of trophoneurotic changes cannot be excluded, and there are some ulcers from local asphyxia of the tissues due to impaired trophic nervous action. This, however, cannot be maintained as a cause in the generality of leg ulcers. In the generality of the cases the enormous infiltration of the connective tissue elements and the diminished vitality of the skin are sufficient to cause the production of local necrosis and the formation of the ulcer. It is quite natural that when the skin has lost so much of its vitality, when it is thick and infiltrated, any contusion, pressure, scratch or rubbing is liable to start the molecular disintegration of the infiltrating elements and produce in consequence the leg ulcer.

On several occasions we have had examined, bacteriologically, the secretion and the detritus of the leg ulcers in the pathologic laboratory of the City Hospital. Bacteria have been found—staphylococci, streptococci, *Bacillus coli*, *Bacillus proteus* and most frequently *Bacillus pyocyaneus*.

Before the rules for the treatment of leg ulcers can be pointed out, it is necessary to recall the pathologic alterations found in the tissues. A piece of the edge of an ulcer was excised, hardened and sections taken for microscopic study. The microphotograph was made by Dr. Charles Goosman of the pathologic laboratory. The photomicrograph (Fig. 4) shows epidermic cells increased in quantity and in size, with an enormous proliferation of the rete mucosum. Between the papillae of the derma, columns of epithelium are seen separating the enlarged papillae. The epidermic cells remain soft and are not subject to keratinization. There is no sign of a horny layer. As the epithelial cells are not susceptible of being keratinized, they are unable to form the natural horny protection to the

4. Schreider: Thèse de Paris, 1883, quoted by John Douglas, Reference, Handbook of the Medical Sciences, New York, 1900, vii, 937.
5. Quenu: Rev. d. chir., 1882, p. 887; quoted by Douglas, see Note 4.
6. Silvy: Thèse de Paris, 1900.
7. Douglas, John: Ulcer, Reference Handbook of the Medical Sciences, New York, 1900, vii, 938.

underlying tissues. The papillae of the derma are greatly enlarged and elongated; they show an enormous quantity of infiltrating cells, with proliferation of the connective tissue cells. The photomicrograph, Figure 5, shows the infiltration and the proliferation of the connective tissues. Their fibers are enlarged and the connective-tissue corpuscles or fusiform cells contain several nuclei in process of proliferation. Plasma-cells are found showing some attempt at defense on the part of the connective tissues. The blood-vessels are greatly enlarged and are surrounded by extravasated blood-corpuscles. Newly-formed blood-vessels are produced by the existing capillaries, increasing the vascularity of the tissues.

Fig. 3.—Ulcus cruris with edema and elephantiasis.

The exudation into the tissues causes their softening, and as a result of this pressure, the nutrition is cut off. Moreover, the presence of bacteria with their toxins, causes the death of the cells, which fall into necrosis. These dead tissues, disintegrated, are thrown off the surface together with the products of exudation. In some cases the process occurs in mass and then gangrene results with destruction of the skin. In other cases cellulitis and phlebitis occur from the bacterial infections with formation of deep abscesses as shown in Figure 2.

Examining the surface of an ulcer in gross, it appears covered with a yellowish-white film caused by the overproduction of round cells, together with the exudation of serum, fibrin and the detritus of the tissues. When the necrosis is extensive then croupous masses are adherent to the bottom of the ulcer over the connective elements. In the so-called callous ulcers the edges are considerably raised above the surface of the ulcer, owing to the epithelial proliferation (Fig. 6).

From the preceding considerations it is easy to see that in ulceration three periods occur: necrosis, sloughing and reparation. On these periods depend the selection of the treatment.

The first period is marked by acute inflammatory symptoms. Infection is shown in the whole area of destroyed skin, the base of the ulcer is depressed and covered with dirty grayish-yellow sloughs. The edges are usually clean cut and inflamed; the surrounding tissues are red, congested and swollen, discharging seropurulent and blood-stained fluid. These conditions are usually accompanied with severe pain. It is at this period that patients go to the druggist asking for some kind of salve to stop the pain. In my practice some of the patients had used one or another kind of salve or paste, which, consisting of resorcin or tar with cocain or other local anesthetics, increases the inflammation and the gangrenous process. The patient is delighted on account of the diminished pain with the result of the application of these salves, and at the same time the condition of the ulcer is always made worse. The application of pastes at this period is very injudicious, because it renders difficult the sloughing off of the gangrenous masses, retains the bacteria-laden secretion and consequently increases the inflammation. The best application at this period is water, usually hot, between 80 and 90 F., and containing some antiseptic preparation. In our practice, both hospital and private, we dissolve sodium bicarbonate or biborate in the water.

Sodium bicarbonate is purely alkaline, like normal salt but to a less degree, and in consequence is less irritant. Sodium borate on account of its alkalinity has slight antiseptic power but diminishes the irritation and the inflammatory symptoms through the removal of bacteria, foul secretions, detritus, etc. In case the ulcers are very foul we use solutions of mercuric chlorid from 1 : 5000 to 1 : 2000, either as a continuous bath or in moist compresses; but so soon as the odor has been eliminated we return to the sodium borate or bicarbonate bathing, because the use of the mercuric chlorid causes irritation of the surrounding skin. In some cases, especially when *Bacillus pyocyaneus* is present, we have found phenol useful in solutions of from 1 to 2 per cent. in warm water. If the patient can rest in a horizontal position with his leg somewhat elevated, the pain and the inflammatory symptoms will subside sooner. The gangrenous and necrotic detritus begins to slough off and a clean surface with healthy granulations appears.

When the surface of the ulcer has reached this condition it needs to be dressed with some remedy which will cover and protect the granulations, remove the secretion, and keep the surface sterile. A great many salves and liniments have been recommended for this purpose. One of the oldest standbys has been the mixture of castor-oil and from 10 to 50 per cent. of balsam of Peru. It has antiseptic power, keeps the surface protected, and promotes granulations. In some cases it is irritant and has produced dermatitis, and for this reason we use this dressing so long as it is useful, and then change it for a more suitable application. Unna[8] studied the different remedies that

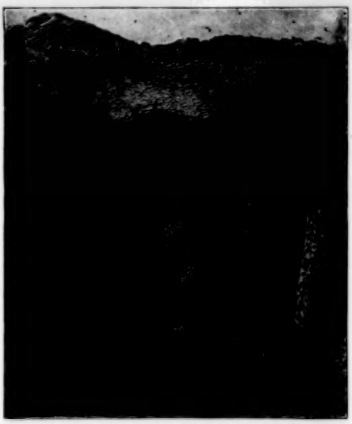


Fig. 4.—Increase of the epithelial layers, lack of horny layers, hypertrophic papillae and infiltration of the corium; from a photomicrograph.

8. Unna: Monatsh. f. Prakt. Dermat., 1891, xiii, 523; Weitere Versuche über die reduzie renden Heilmittel, Deutsch. Med.-Ztg., 1897, No. 69; ref. Monatsh. f. Prakt. Dermat., 1898, xxvi, 114.

favor or delay cicatrization. Indeed, in order that recovery may ensue, two processes must take place, one, the formation of granulations and the other, the formation of good, solid epithelium to cover the granulations and to protect the tissues beneath for the physiologic purposes of repair. It will be easily understood that many remedies which favor the granulations or dermatoplasia, delay or entirely prevent the formation of epithelium. For this last purpose the application of remedies capable of producing oxygen seems to be the best.

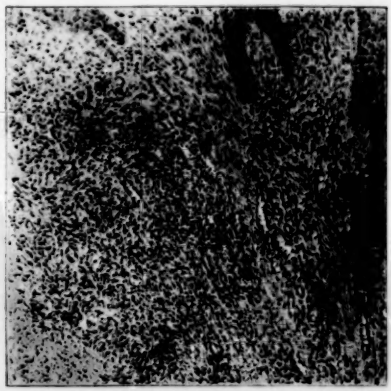


Fig. 5.—Infiltration of the connective elements with proliferation of the cells; from a photomicrograph.

Unna[9] praises pyrogallic acid and asserts that while it could destroy lupus nodules, at the same time by its oxygenating power it could hasten the formation of the scar. For the same purpose he recommends ichthyol, which he places among the reducent agents. For many years, to dress leg ulcers, we have used diachylon salve containing 1 dram of ichthyol to the ounce of ointment. We have obtained very good results and in many obstinate cases we are still using this dressing with beneficial effects. In ordinary cases we find useful the application of petrolatum with 2 per cent. of boric acid spread on a piece of lint, which is changed twice a day. In order to cause an exudate of serum, we have added lanolin, following the formula of Frank C. Carlton, as reported by Wade[10]:

| | |
|---|---|
| Boric acid ..... 8 | ℥ ii |
| Lanolin ..... | |
| Petrolatum, of each..... 60 | ℥ ii |

In many cases of painful irritable ulcers we have found of great benefit the application of a mixture of 20 grains of calomel to an ounce of benzoinated oxid of zinc ointment, Wilson.

Some time ago every leg ulcer was dressed with scarlet-red salve toluyl-azo-beta-naphthol. Von Schmieden and Hayward[11] assert that this highly-colored substance destroys the bacteria and promotes the formation of granulations, and of new epithelium. Scheele,[12] however, called attention to poisoning from the use of scarlet-red and especially to its dangerous action on the kidneys as revealed by albuminuria. Gurbski[13] reported a case of general poisoning with albuminuria after the application of this salve. Lombardo[14] referred to anaphylaxis as the cause of a case of generalized dermatitis from the use of scarlet-red salve. In our service in the city hospital it was used for some time on old, chronic leg ulcers without any perceptible benefit. In some cases the patients disliked the dressing on account of the irritation, and we were compelled to return to our borated ointment, or to our wet compresses to relieve the irritation.

May and Heidingsfeld[15] proposed basic fuchsin in place of the toluyl-azo-beta-naphthol asserting that it caused less irritation and better antiseptic action. Some use thick pastes with picric acid and other ingredients. In our experience we have found that the pastes have to be avoided. They form a thick, heavy crust, which prevents the discharge of the exuded serum, irritates the granulating surface, increases the suppuration and prevents the keratoplasia, which must form the regular solid cicatrix.

When the surface of the ulcer is free from necrotic detritus, when it is clean and the granulations begin to form, we must watch the process of reparation. The granulations must be protected from infection and from irritation, so that they do not proliferate. To hold the granulations within certain limits, we must paint the surface with silver nitrate solution of from 3 to 6 per cent., every two or three days, or, better, with tincture of iodin. Any salve or any dressing with gauze or salve, or a liniment having moderate antiseptic qualities, capable of removing the serum and protecting the surface from the contact of the air, from physiologic or pathologic discharges and from the contact of the clothes, will give good service. In case some syphilitic condition is suspected the application of mercurial plaster will be found always useful.

Massage of the leg with alcohol to promote circulation when the patient is in a recumbent position with the limb elevated has been highly recommended. Surgical treatment is often necessary. When the edges of the ulcer thicken from a superabundance of epidermic production and the formation of the cicatrix does not proceed regularly, the callous edge must be removed. In some cases the Nussbaum process, encircling the ulcer with incisions at a distance of half an inch from the edge, has given good results. When the

Fig. 6.—Ulcus cruris with superabundant granulations.

9. Unna: Ueberhäutung und Ueberhornung (Dermatoplasie und Keratoplasie), Berl. klin. Wchnschr., 1883, No. 35.
10. Wade, Ben. N.: The Management of Chronic Ulcers of the Leg, New York Med. Jour., Feb. 1, 1913, p. 244.
11. Von Schmieden and Hayward: Der heutige Stand der experimentellen und therapeutischen Verwertung der Scharlachfarbstoffe, Deutsch. Ztschr. f. Chir., 1911, cxii, Heft. 4 and 6.
12. Scheele, Karl: Die klinische Bedeutung der Giftigkeit von Scharlach-Farbstoffen in Salben, Diss. Berlin, 1912, reference in Dermat. Wchnschr., 1912, lv, 1634.
13. Gurbski, St.: Zentralbl. f. Chir., 1910, No. 49, reference in Monatsch. f. prakt. Dermat., 1911, liii, 42.
14. Lombardo: Un case di anafilassi per il rosso scarlatto, Gior. ital. d. mal. ven., 1911,
15. May, Eugene S., and Heidingsfeld, M. L.: Basic Fuchsin in Chronic Leg Ulcer, The Journal A. M. A., May 31, 1913, p. 1680.

thick epidermic layer has been removed by means of a thin scalpel the edges are detached and the ulcer may be strapped with adhesive plaster, to change its shape and to bring its edges as close together as possible. In many cases when the granulations are superabundant and a cicatrix is not obtained, the best method is to scrape the granulations thoroughly, making a regular wound, and to cover the surface with epidermic grafts, following the Thiersch method. In several cases of obstinate ulcers we have obtained very good results from this method. When large varicosities are present the veins must be tied or extirpated. In case of cellulitis the abscesses must be opened and the pus drained. The eczema which so often complicates varicose ulcers must be treated at the same time.

Internal treatment must be given, according to the condition of the patient. In my hospital and private practice I always advise the use of potassium iodid, from the knowledge that phlebitis is often originated, maintained and aggravated by a luetic condition. The use of an alkaline purgative is recommended when constipation is present and there is some gouty tendency. In case of anemia from poor nutrition, iron tonics, digitalis or nux vomica should be given according to the condition of the patient.

When recovery has been obtained, the patient must be protected from relapses. We advise our patients to bathe the legs twice a day, to rub and massage the affected leg with a 2 per cent. alcoholic solution of phenol and when dry, to dust it with rice powder or talcum powder; also, in the day time, to wear a well-fitted elastic stocking to prevent the swelling of the leg.

5 Garfield Place.

## ABSTRACT OF DISCUSSION

DR. FRANK E. SIMPSON, Chicago: We usually treat these cases by the application of Unna's gelatin-zinc, covered with a bandage. Under this they heal rapidly, as a rule. The kind of local application, I think, is of secondary importance.

DR. J. B. KESSLER, Iowa City, Iowa: I am using the basic fuchsin paste, and find it less irritating than the scarlet red. More recently, in the treatment of these leg ulcers, I have come to regard the local application as comparatively unimportant and rely largely on elevation of the foot of the bed from 4 to 6 inches and the snug application of an open-mesh bandage during the day.

DR. M. L. HEIDINGSFELD, Cincinnati: The results which Dr. May and myself obtained with basic fuchsin and noted by Dr. Ravogli, still obtain. The remedy, however, must be used with judgment and discretion with regard to strength of the remedy and frequency of application. In some a 0.25 per cent. to 0.5 per cent. ointment is too stimulating, while in others a 2 per cent. to 3 per cent. ointment is readily tolerated. The same is true of balsam of Peru, favorably mentioned by Dr. Ravogli. A 2 per cent. balsam of Peru ointment, applied every few hours, has answered admirably well in my personal experience. There must be a fundamental cause for every chronic leg ulcer. It may be syphilis in one case, varicose veins in another, tuberculosis in a third, etc., and ultimate success can only crown our efforts when the cause is definitely established and properly controlled.

DR. MARTIN F. ENGMAN, St. Louis: The majority of these leg ulcers are seen in middle-aged people with poor cardiac compensation, and it is sometimes remarkable to see the beneficial results following regulation of the condition of the heart by the administration of digitalis, etc. These patients are usually found among the working classes who are compelled to stand many hours daily; they are much less frequent among the idle class of women.

DR. A. RAVOGLI, Cincinnati: In my published paper I spoke of the importance of constitutional treatment of leg ulcers, and the beneficial effect that often followed the administration of digitalis, potassium iodid and other drugs.

# PELVIC VARICOCELE *

WILLIAM EDGAR DARNALL, A.M., M.D.
ATLANTIC CITY, N. J.

The subject of pelvic varicosities is little discussed, little understood and little written about. It is, however, of sufficient importance to be the cause of considerable suffering among women. Pelvic varicocele or varicocele of the broad ligaments consists of a more or less permanent dilatation of the veins of the pampiniform plexus. The condition is not so uncommon as has been supposed. There are few operators of long and extensive experience who do not come across cases of this kind in their gynecologic work, yet the literature on the subject is exceedingly meager. The first case reported in this country was that of Dr. Dwight of Boston in 1887. A. P. Dudley and Zinke of this country have written exhaustively on this subject. Dudley reported four cases, Malins of Birmingham found two more and to these Zinke adds two cases. Rousans states that it is quite common. Winkel, cited by Reed, found the condition present only ten times in 300 necropsies. I have operated in ten cases during the past year.

We must remember that there is a reason for almost every physical discomfort if we can but run it down, and there is a reason for the child-bearing woman who vainly goes from one physician to another with aching pains in the pelvis and back, dragging sensation worse on standing and walking and worse at the menstrual period, and suffering from all the symptoms of pelvic engorgement and pelvic irritation, although the examining physician may not be able to palpate anything on physical examination on which to base a diagnosis. By reason of a failure to find anything tangible, the woman is often assured that there is absolutely nothing the matter and is in the mind of her doctor consigned to that large class of neurotics with magnified imaginary symptoms which center in the pelvis.

The anatomy of the uterus shows that the utero-vaginal plexus of veins extends over the walls of the vagina, and as an especially close plexus along the lateral margins of the uterus, collecting the blood from the uterine veins which surround the uterine artery, and forming broad anastomoses with the pampiniform plexus of the ovarian veins.

The causes of varicocele of the broad ligament are more or less obscure. These veins may become very much enlarged in pregnancy. This enlargement may be due to some form of obstruction to the return circulation due to the position of the organ, wearing tight clothing, etc. It was my rare privilege recently, during an operation for cesarean section, to observe just how large these veins may become. The patient was a young negress of 24 with a justo minor pelvis. The usual operation for cesarean section was done, and when the abdomen was entered, the right broad ligament presented a worm-like tortuous bunch of veins, the main trunk being as large as the index-finger. It is easy enough to imagine that after delivery when the involution of the uterus is not perfect there may be a failure on the part of these overdistended veins to regain their normal size and tone just as often is the case with the long saphenous vein of the leg.

The condition most often prevails in women who have borne one or more children, and especially if the

* Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

perineal supports from below have been impaired and the woman has suffered from a sagging down of the pelvic organs. It may, however, occur in single women who have retrodisplacements of the uterus and who have been compelled to be on their feet a great deal.

Other causes may be a relaxed condition of the tissues from a low state of health, heart- or liver-diseases, habitual constipation or uterine displacements. Some of the intestinal displacements, by angulation of the mesenteric veins, may materially interfere with the visceral circulation and be a cause. Dudley thinks that the left broad ligament is more frequently affected than the right by reason of the fact that the spermatic or ovarian veins being of such length, the weight of such a column of blood has a tendency to weaken the vessels. The left vein also empties into the renal vein at right angles to the blood-current of the kidney, and therefore obstructs the flow of the blood from the ligaments into the general circulation. It must also be remembered that there is an absence of valves in the uterine veins.

Zinke thinks correctly that intra-abdominal pressure from any cause should be added to the list and that often the condition results from some direct or indirect traumatism, such as external violence, frequent application of the forceps during labor, repeated abortions and operation on the cervix and pelvic organs, and to this Bandler adds infection.

Affections of the ovaries and other gross pathologic lesions of the pelvis are of course a very prolific cause of pelvic varicocele. It is not this class of cases I wish to discuss, but only the cases without such lesions. In these more serious conditions of ovarian cystomas and other palpable new growths, operative interference is indicated anyway, and as a matter of fact the symptoms are so masked by those of these serious conditions that diagnosis could not be arrived at, and can be made only in the absence of such lesions.

The kind of cases of which I wish to speak are those of the miserable women who come to you with dull irregular boring neuralgic pain in the abdomen and pelvis, which may sometimes reach a state of intense severity. The pains are usually aggravated by standing or walking and grow worse as the menstrual epoch approaches. There is a feeling of weight and dragging in the pelvis and all the manifestations that accompany pelvic engorgement and irritation. The women may menstruate profusely and sometimes every two or three weeks.

These patients suffer severely at times, and vainly seek relief at the hands of the physician, who on examination can find nothing to explain it. The result is that the symptoms are attributed to hysteria, which term covers a multitude of the sins of ignorance. Often the suffering of the woman assumes such proportions that in these days of kinks, pericolic membranes and displacements, the abdomen is opened for the purpose of finding out what is the matter and with a preconceived idea that there must be crops of adhesions or some undiscovered ovarian cause for the distress of the patient. Inspection of the pelvis, however, may show an entire absence of adhesions, kinks or membranes and that the appendages are without disease. If the veins of the broad ligament are not inspected, the abdomen may be closed without finding the real cause of the trouble, and without relieving it.

The diagnosis will depend on the symptoms outlined above combined with the *absence of any gross pathologic lesion* and the evidence of pelvic engorgement. It is necessary to elicit an accurate history of the character of the pain. If it is worse on standing or walking or as the menstrual period approaches, and particularly if the symptoms disappear as soon as the recumbent position is assumed, it is pretty apt to be due to varicocele, and especially so if the patient has borne a child. The mucous membranes of the cervix and vagina may assume a bluish tint similar to early pregnancy. If to these symptoms are added the loss of support from the perineum below with a certain amount of sagging of the organs, there can be little doubt about the diagnosis. The diagnosis of this condition must be made by exclusion, as must the diagnosis of all complaints which depend on clinical symptoms alone rather than on the tangible findings of physical diagnosis.

All medical treatment is only palliative at best. Temporary relief may be secured by raising the level of the organs by tampons or a pessary and rest in the recumbent position. Surgery, however, is the only means of cure in these cases. The abdomen is opened and the veins should be ligated at both ends and in the middle and freely cut across between the ligatures. Excision of the veins is essential to secure their collapse and to prevent their restoration after the absorption of the ligatures.

The following typical cases are reported. The diagnosis in each of these cases but one was made before the operation and confirmed at the operation.

Case 1.—Mrs. J. R. S., a young society woman aged 26, weight 150 pounds, well developed, was referred by Dr. H. T. Harvey. She was never sick until after her children were born; family history negative. She has had two children, no miscarriages, headaches are frequent and her present trouble dates back to the birth of her last child. Her menstrual periods are regular and painful, last four or five days, but her pain is very much relieved after her period. She has profuse leukorrhea. She sleeps well; appetite and digestion are good. Vaginal outlet slightly lacerated; bilateral laceration of the cervix. The uterus is normal; there is no ovarian or tubal trouble palpable and no bladder trouble. The appendix was removed some years ago by Dr. Joseph Price. She came seeking relief for most intense boring pain in both inguinal regions but worse on the left side. No diagnosis could be made on physical examination other than the lacerations of childbirth, but from the clinical symptoms a diagnosis of varicocele of the broad ligament was arrived at. The lacerations were repaired. The abdomen was opened and all of the pelvic organs were carefully inspected; there were no adhesions; the tubes and ovaries were absolutely perfect; but each broad ligament showed a knotty worm-like mass of varicose veins. These were ligated at both ends with linen and the abdomen closed. Eight months afterward she reports she never felt better in her life and has not a pain or ache.

Case 2.—Mrs. G. J. was operated on eight years ago for a cyst of the broad ligament on the right side. Her father and mother died of carcinoma. She is 41 years old; her appearance is anemic, her weight 105 pounds. She has had two children, no miscarriages. Leukorrhea present. She has headaches, sleeps well, appetite and digestion good, bowels regular. She complains of suffering boring pain on the left side, and menstruates profusely every two weeks. There is no palpable trouble with the remaining left ovary or tube. At operation a thorough inspection of the pelvis reveals no adhesions, no diseases of the tubes or ovaries, but a mass of varicose veins in the left broad ligament. Several weeks after her operation, she reports herself perfectly well and without her usual pain and discomfort and is gaining in weight.

CASE 3.—Mrs. B. B. F., aged 30, married and referred by Dr. Mary Townsend. Father died of pneumonia. She is of a neurotic type, anemic, weight 115 pounds. She has had four children and one miscarriage. Leukorrhea present. Her menstrual periods began at 13 years of age and are painful and profuse, appearing two or three times a month. The vulva is normal; she sleeps well; appetite good and bowels regular. She has very severe lacerations of the vaginal outlet and cervix, the uterus is normal, ovaries normal, tubes normal, bladder normal and there is no palpable disease of the pelvis on physical examination. At operation the pelvis was thoroughly inspected and no palpable disease discovered except a small hydrosalpinx of the left tube, but she had present varicose veins in both broad ligaments. Three months after the operation, she reports herself free from pain and suffering and in good physical condition.

CASE 4.—Mrs. M. L. H., referred by Dr. H. C. Monroe of Pleasantville, aged 24, anemic, weighs 119 pounds; father and mother living and well; patient has had two children and one miscarriage. Leukorrhea is present. Headaches are frequent, backache sacral. Patient sleeps well; appetite and digestion good, bowels regular. She began to menstruate at 13 years of age; periods are regular and without much pain; the vulva, vaginal outlet and cervix are normal. There is no palpable disease of the appendages and the uterus is in good position. She complains of severe pain, worse in the left side and more severe on standing or walking, but relieved on lying down, which is suggestive. The family physician feels that she has chronic appendicitis. When the abdomen is opened the appendix is fixed at the tip with a small adhesion and is slightly kinked but otherwise normal. There are in each broad ligament bunches of varicose veins. The tubes and ovaries are normal with the exception of a small graafian follicle cyst of the left ovary about the size of a hazelnut. The veins on each side were ligated and excised. This operation was only a month ago and too soon to report results.

CASE 5.—Mrs. O. S., referred by Dr. C. Garrabrant. Family history good, married, aged 41, never been seriously sick, general appearance anemic, has borne no children, no miscarriages, no leukorrhea. Has headaches, back aches, intensely neurotic in type, appetite fair, digestion poor, sleeps fairly well, constipated, vulva, vaginal outlet and cervix normal, there is no palpable disease on physical examination of the appendages, menstrual periods are regular and associated with very severe pain which is worse on the left side and worse when she is on her feet. Diagnosis, pelvic varicocele. Opening of the abdomen revealed no pelvic disease with the exception of a few adhesions between the left broad ligament and the sigmoid, but varicose veins more pronounced on the left side were found. On account of her age and the hysteric type of woman, it was thought better judgment to make assurance doubly sure, and a subtotal hysterectomy was performed. Eight weeks after operation, she reports herself relieved of her pains and is gradually getting her strength.

CASE 6.—Mrs. L. S. aged 33, referred by Dr. E. C. Chew, family history negative, was never seriously sick; is anemic and thin and has been suffering for a year or more. She has had no children, no miscarriages, sleeps fairly well, appetite and digestion poor and is constipated. Headaches are frequent. Leukorrhea is present. The menstrual periods are intensely painful, the pain being much aggravated at that time. The vaginal outlet and cervix are normal; uterus, tubes and ovaries show no palpable disease on examination. There is some tenderness over the appendix and some irritability of the bladder. At operation the appendix is found to be normal. There is a graafian follicle cyst of the left ovary. The left broad ligament contains varicose veins. The ovary and the veins were removed. One year afterward she reports herself entirely well.

Section of cervix and broad ligament, showing enlarged veins. *Ur.*, ureter; *U. A.*, uterine artery; *U. V.*, uterine vein; *O. A.*, Ovarian artery; *O. V.*, ovarian vein.

## ABSTRACT OF DISCUSSION

DR. LAURA BRANSON, Iowa City: I believe that the importance of the broad ligament has long been underestimated. While I agree with Dr. Darnall that pregnancy is one of the most general causes of the lesion of the broad ligament designated "Varicosity," yet I also say that menstruation plays the same rôle in the formation of this varicosity although in a very much modified degree, because I consider menstruation a miniature pregnancy and although the after-effects may take longer time to become known, yet they are really as important as those caused by pregnancy. I believe that the diagnosis is arrived at only by exclusion. Since giving a great deal of attention to the study of gall-stone lesions, and noting how surgeons in operations on the abdominal cavity for other conditions have discovered gall-stones, it has seemed to me that we have been furnished more effective means of diagnosing gall-stone lesions. I have felt that our best diagnosis of this lesion must depend on similar efforts by surgeons in their work on the pelvic cavity, and that therefrom, in the course of time, we shall have definite symptomatology by which we shall be able to diagnose these lesions more accurately. I observed the case of a nullipara aged 28. Her abdomen was opened for supposed adhesions five years after an operation for appendicitis. No adhesions were present, but when the surgeon was about to close the abdominal cavity, in the prolapsed broad ligament there was found a soft fluctuating mass 2.5 cm. long and 0.75 cm. in width where the vein with its undisturbed circulation should have been. This was dissected out, the abdomen closed and in the year following the patient suffered none of the symptoms which she had previously had, those of pain in the iliac region, distress on standing, pain and sensation of fulness lessened on assuming recumbent position, and menstrual dis-

turbance. This patient never having been pregnant, the case confirms my opinion that these pelvic varicosities may follow pathologic menstruation, although it may take a long time for the accumulated effect to be known. This may also prove that the symptomatology may be arrived at through surgical work on the pelvis.

Dr. J. H. Carstens, Detroit: The cases I have seen have always been in connection with some pathologic condition. They do not seem to me to be very common. I have seen a couple which I found afterward without having diagnosed the trouble, but these cases all have some kind of trouble for which you operate; so really the end of the whole subject is that there are certain cases in which the symptoms are very obscure and in which you cannot find any enlargement of the veins in the vagina. Usually the only symptoms are pain and a sense of dragging and other symptoms, which require exploratory operation. I think the pathology is the same as in varicocele of the man; it is a matter of anatomy in which there is apt to be enlargement of the veins.

Dr. S. M. Miller, Peoria: This subject is far more important than we have considered it to be. I have run across the condition a number of times at operation when it has not been previously diagnosed. I have a number of times confirmed the condition at operation when only a tentative diagnosis had been made. I seldom have had the temerity to make such a diagnosis *per se* because the condition was accompanied by no definite symptoms except one mentioned in a German publication.

It has been remarked that, if the patient is examined in the upright position, the veins of the vaginal plexus may be felt as a doughy mass. Dr. Kanavel of Chicago and I brought this to the attention of the medical profession eight or nine years ago in the *American Journal of Obstetrics*, dividing it into two classes, the primary and the secondary. By secondary we mean those cases which follow other pelvic lesions and are commonly found accompanying the condition. In that event the treatment would not resolve itself into ablation of the veins, but would be applied to the primary condition. It is usually accompanied by other complicated conditions than the cause of the varicose veins. I have seen an almost hard, white, small, friable, cystic ovary which I believed to be the result of varicosity of the vaginal plexus. This is not proved but would seem to be the solution of the small cystic fibrous ovary with varicose veins in the vaginal plexus. The pain may be of two varieties: pain on standing, aggravated at the periods, and pain in the ovary itself. These small ovaries with cysts are painful; pain is present at any time; this is an end-result. The proportion of primary to secondary cases is one to ten. The large number of secondary is due to pelvic relaxation. In illustration, I operated on a primary case in a woman who had no pregnancy and who was sterile. These multiple cystic fibrous ovaries, the result of varicosity, will result in sterilization. I had been able to find nothing in examination of the woman. She had had a painful left ovary. At operation this was obliterated with the broad ligament. Pain and tenderness have now recurred in the right ovary. The condition I believe is very often overlooked at operation because it is more emphasized with the patient in the upright position than in the Trendelenburg position, and unless one is looking specifically for the condition it will in many cases be overlooked. I have treated the condition in two or three ways, in some cases entirely obliterating the ovary, tube and broad ligament; in others, I have sectioned the broad ligament; still others, I have quilted under the broad ligament and the fallopian tube, and then further down have repeated the quilting. Mere ligation at one point will not correct the condition. The treatment has been successful, but difficult because it cannot be accomplished without troublesome hemorrhage from these freely bleeding veins.

Dr. Hugo Pantzer, Indianapolis: I have found this condition dissociated from other active causes in two or three cases only; these impressed me with its importance. The first case, reported in the early nineties before our local gynecologic society, was that of a woman in whom I found a large doughy mass on the right side and felt that it was owing to some ovarian circulatory disturbance. When I next saw the patient in bed I failed to find anything. The next time she came to my office, and the mass was again found on examination. The diagnosis of pelvic varices was then made. The patient died of typhoid fever shortly afterward. I have not operated on any of my cases. I would regard the sclerotic ovary as rarely a cause, if ever, of pelvic varices.

Dr. Swithin Chandler, Philadelphia: Twelve years ago I examined a bladder and noticed on the left side much congestion. I was unfamiliar with this condition, and wrote to several men concerning it. I think it was Dr. Kelly of Baltimore, who suggested that probably there were enlarged veins on the left side, which would occasion this condition of the bladder. On that suggestion I opened the abdominal cavity and found the condition mentioned. There are three different phases of the question: diagnostic, complications during the operation, and the condition after an operation. The symptoms which Dr. Darnall has detailed are quite classical. It seems to me that this paper should go broadcast in order that the general practitioner may realize that this symptomatology is not merely a part of a woman's nervous and hysterical condition. I saw a man operate on a case in which the diagnosis had been made of a tear in the cervix and an enlarged ovary. The abdomen was opened, the cavity explored and nothing seen. The operator then sewed up the cervix and left an enlarged vein, which I am sure is going to give trouble. In the after result the cases should be carefully watched. In one case of enlarged veins I did a Baldy operation. That is the only operation I know that will hold up the uterus and the ovary and bring a perfect gravity situation into play. The woman was thoroughly relieved. Had the veins been larger I would have done what Dr. Darnall has described, and it might have been wiser, but the patient was entirely relieved. I believe so firmly in the Baldy operation that I took a chance and the operation was successful.

Dr. E. Gustav Zinke, Cincinnati: A peculiar circumstance happened a few weeks ago after I had written on the subject. The patient was about 35 years old, the mother of two children, both prematurely born, with a history of persistent bleeding throughout the entire period of pregnancy in each instance. When I was first called to see her she was pregnant apparently six weeks and she bled quite profusely, but because of her pregnancy I put her on her back. The os was not opened, the cervix not obliterated, and there was no evidence of any miscarriage except the hemorrhage. I was in hopes that by rest and the application of an ice-bag I might arrest the hemorrhage and prevent abortion. She continued to bleed, however. I therefore curetted and packed the uterus. After removing the gauze at the end of forty-eight hours she was apparently free from hemorrhage. Next day she was bleeding again and this continued in greater or less degree for four or five months. When she became gradually exsanguinated I said that something was wrong, we must open the abdominal cavity and see what the difficulty was. Of course I had no idea that she was pregnant again or I should not have opened the abdomen; but it was a good thing I didn't know she was pregnant, for when I opened the abdomen the entire pelvic cavity was filled with a mass of varicose veins, and out of the center appeared a flaccid, transparent cyst, which appeared to me to be parovarian. My first impulse was to remove that cyst. I pulled it out of the abdomen with a pair of forceps, when it contracted and became as firm as a cricket-ball. I removed the forceps, put a warm sponge on the place where I had had hold of it with the forceps, until the hemorrhage ceased, dropped it back into the abdominal cavity, sewed up the wound and she went to the end of her term, giving birth to a living child which was apparently perfectly well. She has not had a pain or ache since. I do not know what has become of the varicosities; they cannot be felt. Whether they existed merely because of the pregnancy, I do not know. The case is one which cannot be explained. I have never been satisfied concerning it.

DR. W. E. DARNALL, Atlantic City: Dr. Zinke's case is exceptional. Ordinary one would have expected his patient to have had much pain and discomfort. What became of the pelvic varicosities which he did not remove, it is hard to say. Dr. Carstens says he does not find these veins except with other gross pathologic lesions. Perhaps if he looked for them more carefully he would find them. I think we surgeons, particularly, get into the habit of neglecting clinical symptoms and depending too largely on what we can palpate, while the clinical symptoms are relegated to a remote corner of our diagnostic brain. I have a feeling that Dr. Miller is right about the complicating conditions being a result rather than a cause of varicose veins, but of course this is rather hard to prove. My experience coincides with his that the patient refers the pain to the ovary and is so firmly convinced that she has ovarian trouble that she will ask for an examination, and if the examiner tells her her ovaries are all right she will often go to some one else, feeling that from the pain she suffers she must have some affection of the ovary which the first physician could not discover. Varicose veins can rarely be palpated and then only in the standing position, but the diagnosis can be made from a careful study of the history and the clinical symptoms.

## NOTES ON CASES OF SPRUE INVALIDED FROM THE TROPICS; WILL IT BECOME ENDEMIC HERE?*

H. B. HIATT, M.D.
HIGH POINT, N. C.
AND
W. ALLAN, M.D.
CHARLOTTE, N. C.

It has been shown by Price[1] that of the missionaries sent into tropical countries, a large percentage have to be invalided home; from India 46 per cent., from China 51.5 per cent., from Africa 79 per cent. The rate invalided home for sprue is available only from Central and Southern China, being 2.5 per cent. of those sent home from the former region and 4.5 per cent. from the latter. Harford,[2] a former physician to the Church Missionary Society (England), states that he regards bowel disorders as the most important cause of invaliding, and specifically mentions sprue as a common and serious cause.

To come nearer home, sprue is widely prevalent in Porto Rico,[3] which is being invaded at present by Americans in large numbers.[4] As people suffering with sprue are constantly returning to this country from the tropics, the profession will have to consider this disease both from a clinical and a public health point of view. Inasmuch as many eminent students[5] of tropical medicine consider sprue communicable and even infectious, it may very possibly become endemic in the Southern states. The comparatively recent introduction of pellagra into this country and its subsequent very rapid spread in the South, should be a warning to us to study our neighbors' diseases as well as our own.

The present observations are based on three cases of sprue from Porto Rico, two from China and one native case which was in all probability sprue; but, since the latter case passed from observation, it could not be studied at length. The clinical picture of sprue consists chiefly of gastro-intestinal symptoms — stomatitis, flatulence with great distention, diarrhea with large, pale, frothy, acid stools, atrophy of the intestinal mucous membrane with diminution in size of the liver and secondary anemia with loss of weight and strength; the course of the disease is chronic with a marked tendency to relapse.

The sprue stomatitis consists in a red, bald appearance of the tip and edges of the tongue, sometimes nearly all of it being involved. Aphthous ulcers are common. The edges and tip of the tongue become sensitive and the patient often complains of a burning, prickling sensation, even while the tongue is still apparently normal.

The diarrhea starts gradually; is of the early morning type until the case has progressed so far that bowel movements continue throughout the day. Straining and tenesmus are not common, but generally there is moderate pain and discomfort before stool and at other times from the passage of large amounts of gas along the bowel. The large gas production, combined with the atrophy of the intestinal wall and the thinning and weakening of the abdominal muscles, allow great distention, which is uniform over the whole abdomen and which remains constantly present.

The stools are the most characteristic part of the picture. Their bulk is great. The odor is very disagreeable. They may be watery or of the consistency of molasses, are putty-colored and have a strongly acid reaction. The fecal matter is intimately impregnated with fine bubbles of gas causing the stool to resemble ordinary apple-float very much in appearance, except for the color. Microscopically, the lack of fat digestion is striking; the numerous fat droplets may show a ring of varying thickness of fatty acid needles around the periphery, indicating that a slight amount of fat cleavage has taken place, but there seems to have been very little saponification. After the ingestion of meat, many meat fibers appear in the feces. Schmidt's hydrobilirubin test was very weakly positive in our cases.

The loss of flesh and strength may determine death from exhaustion. The blood shows a secondary anemia.

### REPORTS OF CASES

CASE 1 (W. A. 616).—A white man, American, aged 25, single, teacher, was referred by Dr. W. A. Glines of San Juan, Porto Rico, in September, 1911. He had been in the island five years. Family and past history were unimportant. The present trouble started in 1909, as sore mouth and diarrhea, following grip and tonsillitis. His weight dropped from 145 pounds to 100 pounds, and he became so weak and emaciated that he returned to New York state in August, 1910. By March, 1911, he had improved somewhat, had gained 14 pounds and returned to Porto Rico.

Present condition shows weight 95 pounds, temperature 97, systolic blood-pressure 94 mm. Hg. Patient very weak, thin, anemic, with edema of the ankles and with harsh, dry skin. Physical examination negative. Blood shows severe secondary anemia; normal differential count; no plasmodia; urine normal; feces liquid, acid, frothy, composed largely of fats and fatty acids.

He had at various times been on buttermilk, meat, whole milk, no starch diets, etc., and for the past several months has been living on artificially soured whole milk. He complains of numbness of any part of the body on which he lies, from the scalp down, and of cramps of the extremities,

* Read before the Section on Practice of Medicine at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Price, G. B.: Brit. Med. Jour., Nov. 15, 1913, p. 1293.
2. Harford, C. F.: Brit. Med. Jour., Nov. 15, 1913, p. 1297.
3. Ashford, B. K.: Am. Jour. Trop. Dis., 1913, i, 146.
4. Census figures give 2303 in year 1910.
5. Manson, Bahr, Begg, etc.

and says he cannot think about anything except something to eat. Tongue is sensitive with a raw tip; abdominal distention great. One stool is passed at 2 a. m. always, from three to four before midday, and from two to three between midday and midnight. He sleeps from 9 p. m. to 2 a. m. but rarely after the 2 a. m. stool.

The patient was put to bed on a milk and grape diet. Sodium bicarbonate enemas were tried but found too exhausting. Several attempts to feed raw eggs convinced us that proteins were harmful at that time. After two weeks in bed he suddenly collapsed, developing an acidosis with air-hunger and acetonuria, and was thought to be dying. Alkali was given by rectum, and after the acidosis subsided enough milk and lactose lemonade were given to supply 1,000 calories daily. The abdominal distention and discomfort were so extreme that we determined to give monosaccharids instead of disaccharids. The only available monosaccharid at the time was glucose from the candy-maker's shop, so this was fed in lemonade, tea, grape-juice and milk. Later, almost raw liver and pancreas soups were added. The patient was discharged from the hospital in November and by February, 1912, had reached 127 pounds. There has been no return of the trouble since.

Case 2 (W. A. 1071).—A white, American woman, aged 42, married, housewife, came to us from Porto Rico in September, 1913. Family history was unimportant. The patient had lived in Porto Rico since 1909. She had had acute rheumatic fever at age of 12, followed by chorea, and later had quinsy; has had joint pains either with or without fever and swelling, severe enough to put her in bed, off and on, for the past thirty years, except when living in the far south, Key West, or San Juan. Present trouble began in February, 1911, with a feeling of fatigue and weakness. Within a month the diarrhea started. The gums and lips became sore in May, 1911, and she lost weight. She took six weeks' milk and rest cure and was well again by July. The second attack started in February, 1912, with laziness, sore tongue and gums and later diarrhea of the early morning type, starting at 2 a. m. and subsiding by noon. She reached twenty stools a day with such abdominal distention that she could not wear some of her clothes. She dragged along in and out of bed until March, 1913, when she became too weak to feed herself and weighed less than 100 pounds. She was out of bed again in June. Since January, 1913, she has taken nothing but milk, except for three weeks in July when she tried a meat diet but without benefit. In March, 1913, she took the yellow santonin treatment until she "saw yellow" and vomited; she was unable to take more than 1 grain every second day; she has taken occasional doses ever since. Present weight is 129 pounds, which is only 15 pounds below her normal weight. Every two hours she is taking a pint of milk up to four quarts a day. Physical examination negative except for the tonsils, which are large and matted down by adhesions from both pillars. Blood shows moderate secondary anemia, normal differential count, no plasmodia. Urine is negative. While the case was under observation, worry or fatigue would precipitate diarrhea with the typical acid, frothy, fatty stools; at other times the bowels were normal. At first the patient was put to bed on a milk and monosaccharid diet of grapes, honey and bananas. After a few weeks toast, baked apples and potatoes were added, and later cereals, eggs and cheese. By the middle of November she could be up all day, weighed 135 pounds, was taking solid food three or four times a day instead of milk eight times and her menstrual cycle, which had shortened to three weeks, again became normal. She was advised to visit in the United States until perfectly strong again, but intense homesickness with the difficulty in leading a regular life while visiting from place to place, soon counterbalanced the benefit of a northern latitude, and she returned to Porto Rico in March. The excitement of homecoming precipitated several days' diarrhea again.

Case 3 (H. B. H. 20).—A white woman, aged 32, married, housewife, who had never been out of North Carolina, was seen in July, 1913. Her father had died four years previously of pneumonia superimposed on chronic pellagra. Past history was unimportant. Present trouble started in February, 1913, with a diarrhea which at first consisted of from four to five stools daily, but which, in spite of medication, soon increased to ten or twelve stools daily. The diarrhea started about a month before expected confinement, which occurred several weeks early. An intense burning in the mouth and esophagus was present. She grew steadily worse, and when seen in July, had stomatitis, burning in the esophagus, extreme flatulence, and a diarrhea of from fourteen to twenty stools daily, beginning in the early morning and lasting throughout the day until about 6 p. m., after which she was not troubled until the next morning. The diarrhea was painless and the stools were of a pale yellow, or putty color, very frothy and expelled with a great accompaniment of gas; they had never contained blood. The patient had lost considerable flesh and was much weakened. Examination of chest and extremities was negative. The abdomen was tightly distended with gas, puffed out like a small balloon, and gave a doughy sensation on palpation. The superficial veins were dilated. No skin symptoms have ever been present. The blood showed hemoglobin 65 per cent., red cells 3,200,000; white cells 8,000; smear showed some poikilocytosis, red cells otherwise normal; no plasmodia. Sputum and urine were negative. Feces show a very offensive, voluminous, nearly white acid stool, frothy from the intimate admixture of fine gas bubbles. Microscopic examination showed no ova, no protozoa, many fat droplets and fatty acid crystals, with some splitting of the periphery of the fat droplets.

The patient was immediately sent to the mountains for the remainder of the hot season. At first, following a careful diet, the improvement was marked. As she improved, however, she became careless in diet and grew worse again. Becoming despondent over this she returned home and placed herself in the hands of my colleague, Dr. Duncan, who advises me that at present she is much improved, having gained greatly in weight and strength. He states that his treatment consisted of a diet of milk and fruits, and that the only medicine to which he could ascribe any beneficial results was iron, given over a long period.

Case 4 (H. B. H. 25).—A white woman, American, aged 38, married, housewife, was referred by Dr. J. T. Burrus of High Point in August, 1913. Family history was negative; past history negative until the patient went to Porto Rico as a missionary in 1904. Within a few months she contracted malaria, which proved so severe she was forced to return to the States. She continued to have one chill a month for a time but finally recovered entirely and returned to Porto Rico in 1906, where she remained until 1909. During these three years she enjoyed good health. The present illness began in May, 1912, three years after she had left the tropics. The first symptoms were slight diarrhea, from three to four stools daily, with some flatulence and stomatitis.

In spite of constant treatment the patient had grown steadily worse during the past eighteen months until, when seen, she weighed only 75 pounds. There was no subcutaneous fat; the dry, harsh skin was drawn tightly over the bony prominences. Mucous membranes were pale, skin muddy, eyeballs prominent from loss of orbital fat, hair lusterless, mouth and tongue the seat of subacute stomatitis. The pharynx and esophagus were not involved; chest and extremities negative; vision and reflexes normal. The abdomen was tensely distended, with thin walls and dilated superficial veins, everywhere tympanitic, and liver dulness obscured; doughy sensation on palpation. Pulse was 80, temperature 98, systolic blood-pressure 94 mm. Hg. Stools from eight to twelve daily, beginning between 12:30 a. m. and 2 a. m., and continuing until noon, with several in the late afternoon. At this time the patient was spending all of her time out of doors on a cot, or walking for short distances; in spite of this full exposure to sunlight there had never been any erythema on the exposed parts. Blood

showed hemoglobin 60 per cent., red cells 3,000,000, white cells 4,600, normal differential count, no plasmodia. Urine was normal. Stools large, acid, frothy, putty-colored, no parasites, no occult blood, Schmidt test positive. Microscopically, undigested food, fat droplets, and fatty acid crystals made up the picture.

The patient was put on a milk and monosaccharid diet, without any medication, and a month later eggs, cereals, baked apples, potatoes, butter, and white meat added. She was permitted to go home under observation in September, and finally discharged in December. At this time she weighed 136 pounds, had a systolic blood-pressure of 119 mm. Hg, felt perfectly well and was having one or two stools a day.

In the treatment of sprue a great number of remedies have been recommended, such as potassium chlorate with morphin and bismuth,[6] powdered cuttlefish bone,[7] colloidal silver,[8] phenyl salicylate (salol), betanaphthol, mercuric chlorid, cyllin, izal (cresol preparations), acetozone and ipecacuanha.[9] A few years ago Begg[10] brought forward yellow santonin as a specific remedy, but Rogers, Manson and Castellani, working in India, have all failed to confirm Begg's results, and Ashford[11] working in Porto Rico, says, "Santonin, therefore, if it has any such specific action as that intimated by Begg, does not seem to be superior to a carefully supervised diet, especially a milk diet."

Rest in bed is obviously essential. The use of any drug as a specific is at present purely empirical. Moderate use of alkali seems rational. In severe cases the exclusive meat diet, or exclusive whole milk diet seems to us irrational. The fruit diet is simply a monosaccharid diet, and this in conjunction with skimmed milk seems to us to be the best diet to use in severe cases. The advent of cold weather, particularly cold nights, has apparently been of greater benefit to our patients than any other single factor. We know that the best treatment for pellagra is removal to the mountains during the hot months, and for the same reasons we think that in active cases of sprue the patients should not attempt to remain in the tide-water or piedmont regions during June, July or August.

Stuart,[12] Burnet,[13] Jackson[14] and others,[15] maintain that sprue and pellagra are the same disease, or in other words that sprue is "pellagra sine pellagra." While our experience with sprue is very limited, our experience with pellagra has been considerable, and we see no reason to confuse these two diseases. They have in common sore mouth, diarrhea, secondary anemia, loss of flesh and strength. Sprue has none of the nervous, skin, uterine, vaginal and rectal symptoms of pellagra, while pellagra is not characterized by the distention, and usually not by the early morning type of diarrhea found in sprue. The stools in the two diseases are totally different; the pellagra stool is large and liquid but composed of food remains hurried through the intestinal canal; the intimate admixture of fine bubbles of gas, the intense acidity and the characteristic picture of partially split fats are entirely wanting. We have elsewhere warned against the diagnosis of pellagra on the grounds of sore mouth and diarrhea.[16]

6. McDonald, W. C. C.: Australasian Med. Gaz., June, 1911.
7. Cantlie, J.: Brit. Med. Jour., Nov. 15, 1913, p. 1296.
8. Manson, Sir P.: Tropical Diseases, New York, William Wood & Co., 1908, p. 477.
9. Rogers, L.: Dysenteries, Oxford Univ. Press, 1913, p. 320.
10. Begg, C.: Sprue, New York, William Wood & Co., 1912.
11. Ashford, B. K.: Am. Jour. Trop. Dis., 1913, i, 146.
12. Stuart, C. E.: Abstr., Jour. Trop. Med., 1913, xvi, 287.
13. Burnet, J.: Are Pellagra and Sprue One and the Same Disease? Abstr., THE JOURNAL A. M. A., Sept. 16, 1911, p. 1014.
14. Jackson, T. W.: Tropical Medicine.
15. Tyson and Fussell: Practice of Medicine, p. 1164.
16. Allan, W.: New York Med. Jour., Dec. 18, 1909.

## SUMMARY

Cases of sprue are constantly sifting back into this country and should be recognized and treated as such. Sprue should not be confused with pellagra. Rest in bed, a monosaccharid and skimmed milk diet and cold weather seem to be the most important factors in the treatment. Sprue may very possibly be or become endemic in the Southern states.

## ABSTRACT OF DISCUSSION

DR. ROGER S. MORRIS, Clifton Springs, N. Y.: Did Drs. Hiatt and Allen make gastric analyses in their cases or not? The diarrhea which the patients had is described as a morning diarrhea, and it occurs to me that this may have been associated with conditions in the stomach.

DR. H. B. HIATT, High Point, N. C.: We made gastric analyses in all cases and nothing in particular was obtained from them. Sometimes we met achlorhydria and sometimes the conditions were normal. The morning diarrhea we considered to be the result of the low blood-pressure. The object of reporting the cases was to call attention to this subject and to utter a warning. If sprue should become endemic in the South its spread might be as rapid and the disease become as common as pellagra.

# THE BLOOD IN ACIDOSIS FROM THE QUANTITATIVE POINT OF VIEW*

W. McKIM MARRIOTT, M.D.

ST. LOUIS

Although the elimination of acetone bodies, found in the urine in various conditions, has been thoroughly investigated, we still lack reliable information as to the extent to which these substances may accumulate in human blood and tissues during life. Diminished alkalinity of the blood, such as may occur in acidosis, is a condition unfavorable to diuresis, so that it is quite possible to have only a moderately high excretion of acetone bodies in the urine of a patient who may exhibit symptoms of severe acid intoxication. It is in such cases that an analysis of the blood should yield data of diagnostic and prognostic value.

By a method, which is described elsewhere,[1] it is possible to determine acetone, aceto-acetic acid and beta-oxybutyric acid in small amounts of blood drawn directly from a vein. From 2 c.c. to 5 c.c. of blood is sufficient, and the analysis may be carried out in about the same time as is required for an analysis of the urine for the same constituents. When analyzed according to this method, normal blood from man, dog, pig and beef is found to contain less than 1.5 mg. of gross aceto-acetic acid (acetone preformed, plus aceto-acetic acid), and less than 4 mg. of oxybutyric acid per 100 gm. of blood, all results being expressed in terms of acetone.

A number of pathologic conditions associated with acidosis have been studied, including light and severe diabetes, febrile conditions of childhood, postoperative acidosis and experimental phloridzin and pancreatic diabetes in dogs. In all these conditions the acetone

* Read before the Section on Pathology and Physiology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Marriott: Jour. Biol. Chem., August, 1914.

bodies were present in the blood in excess of the normal. The highest figures obtained were from the blood of a patient with severe diabetes at a time when he exhibited signs of impending coma. In this instance, the oxybutyric acid amounted to 45.2 mg. per 100 gm. and the gross aceto-acetic acid to 28.0 mg., both calculated in terms of acetone.

The accumulation of the acetone substances in the blood and the excretion of these substances in the urine did not always run parallel. Administration of alkali resulted in considerable alteration in the relative distribution of the acetone substances between the blood and the urine, the effect being to diminish very considerably the concentration of these substances in the blood, without at the same time bringing about any appreciable change in the total daily output in the urine.

Analyses of the blood for preformed acetone indicated that this substance may amount to more than 60 per cent. of the gross aceto-acetic acid, in conditions of severe diabetes. With alkali therapy, preformed acetone showed a relative diminution. That is to say, the alkali appeared to decrease the decomposition of aceto-acetic acid.

In the bloods examined the ratio of oxybutyric acid to total acetone substances ("beta ratio" or Kennaway, Pembrey and Poulton) varied from 50 per cent. to 80 per cent. The significance of this ratio is not, as yet, entirely apparent. It is possible that a high ratio may be an indication of partial asphyxia; for we know from the work of Embden, Friedmann, and Dakin and their collaborators that, with diminished oxygen supply, various organs of the body readily effect the reduction of aceto-acetic acid to oxybutyric acid, whereas the reverse change is favored by the presence of an abundance of oxygen.

So far I have spoken only of the accumulation of the acetone substances in the blood, and have said nothing of the tissues. The blood, however, appears to be a fairly satisfactory index of the extent to which acetone substances may accumulate in the tissues. For example, it was found that the blood and liver of a starved phloridzinized dog contained the same amounts of acetone bodies per 100 gm. and the muscles approximately one-half as much. The beta ratio, however, was higher in the muscles and liver than in the blood, and this would, of course, be expected as there would be relatively less oxygen in these organs than in blood.

It is not intended here to present a detailed discussion of acidosis but merely to indicate some applications of a method which I believe to be capable of throwing light on the subject of acetone body acidosis.

Washington University Medical School—Laboratory of Biological Chemistry.

## ABSTRACT OF DISCUSSION

PROF. A. J. CARLSON, Chicago: I should like to ask Dr. Marriott for the findings in the pancreatic diabetes in dogs. It has been my experience in this experimental diabetes that there is not in the urine or in the breath of these dogs the characteristic acetone odor that is found in advanced cases of human diabetes. Was there any indication of increase of acetone in the experimental dogs comparable to that in cases of human diabetes?

DR. W. MCKIM MARRIOTT, St. Louis: I was surprised to find that in pancreatic diabetes in the dog there was only the very slightest increase in acetone bodies, nothing at all comparable to that of human diabetes or even of phloridzin diabetes in the dog; the figures were just above the normal.

# DIPHTHERIA OF THE SKIN OF UNUSUAL TYPES

### REPORT OF TWO CASES *

FRANK CROZER KNOWLES, M.D.
Instructor in Dermatology, University of Pennsylvania, Department of Medicine; Clinical Professor of Dermatology, Woman's Medical College of Pennsylvania
AND
LEONARD D. FRESCOLN, M.D.
PHILADELPHIA

Diphtheria of the skin was first recognized by Chomel[1] in 1759, and by Samuel Bard[1] in an epidemic in New York in 1771. Although the diphtheria bacillus was not discovered until 1883 by Klebs[1] and 1884 by Loeffler[1] of Greifswald, working independently, as early as 1830 Trousseau[1] wrote extensively of cutaneous diphtheria. It was not, however, until 1891 that the integumentary outbreak of this affection was studied not only clinically but also bacteriologically by Neisser.[2]

The invasion of the skin by the Klebs-Loeffler bacillus is of infrequent occurrence, as shown by the report of the St. Anne's Children's Hospital of Vienna.[2] From 1894 to 1902, out of 2,217 clinical and bacteriologic cases of diphtheria the cutaneous surface was attacked in but twenty-three instances, and the most of these were of the false-membrane type. Mallory[1] has found in a series of 251 cases of diphtheria that the skin was attacked in but one instance and the lesion was then of the false-membrane type.

Trousseau's original contention that cutaneous diphtheria was preceded by some tissue loss, no matter how slight, is the view held by the present-day investigators, notwithstanding Daviot's[3] view to the contrary.

The bacillus gains entrance to the skin through some opening, in cracks, slight excoriations, erosions resulting from herpes, in the breaks in the continuity of the skin secondary to an eczema, an intertrigo or an impetigo, etc. Cutaneous diphtheria may be of primary occurrence and limited to the integument; the infection may be conveyed to the larynx, throat or nasal mucous membrane, or, as is usually the case, the skin is secondarily involved, the mucous membranes, just mentioned, showing the original lesions.

Inoculation of the skin with the Klebs-Loeffler bacillus occurs in one of three ways: by auto-inoculation, by means of some article of clothing, utensils, etc., containing the same, and from one person to another by close contact, as by kissing, coughing, circumcision, etc.

Numerous varieties of lesions have been reported in which the diphtheria bacillus has been found. The most frequent of these is the false-membrane type. The other types which have been recorded are the ulcerative, gangrenous, eczema-like, impetiginous eczema-like, pustular and impetigo-like, ecthymatous, vesicular and varicella-like, bullous, dermatitis herpetiformis-like, carbuncular-like, and the tumor and abscess.

*False-Membrane Type.*—The older writers on diphtheria of the skin affirmed that every case had a diagnostic false membrane. The break in the conti-

* Read before the Section on Dermatology at the Sixty-Fifth Annual Session of the American Medical Association, Atlantic City, N. J., June, 1914.

1. Quoted by Nuttall, G. H. F., and Graham-Smith, G. S.: The Bacteriology of Diphtheria, New York, G. P. Putnam's Sons, 1908.
2. Quoted by Marschalko: Arch. f. Dermat. u. Syph., 1909, xciv, 359.
3. Quoted by Jack: Brit. Jour. Child. Dis., 1913, x, 456.

nuity of the skin attacked by the bacillus would become painful, puff up, there would be a profuse fetid discharge, a false membrane would form and the edge of the patch would become elevated and the bottom ulcerated. Not infrequently an attack of erysipelas would develop around the diphtheritic patch. It was not rare, however, to observe an attenuated form that consisted of grayish plaques, more dry than moist, discrete and slightly spreading. These plaques are detached in from about eight to ten days, some persisting for a longer period.

Bernard and Jacob[1] found diphtheria bacilli in gray ulcerating patches on the thigh of a soldier. Bolton and Brewer[1] cultivated the organism from a sore, showing a black central scab surrounded by sloughing portions of dirty white skin, on the groin of a girl. Williams[1] isolated virulent diphtheria bacilli from a membrane on the finger and from the throat of the same patient. Other instances are too numerous to mention.

*Wound Diphtheria.*—Wound diphtheria, so-called, is of fairly common occurrence, developing either secondary to nasal, throat or laryngeal diphtheria of the afflicted person or from some one else with the disease. Several instances of cutaneous diphtheria have occurred in insignificant wounds (Park,[1] Pitts[1] and others). Tavel[1] mentioned a case of infection in the operation for spina ventosa; Bruner,[1] three cases of wound infection, in one of which virulent, and in the other two non-virulent, diphtheria bacilli were found; Sponck,[1] three examples of infection of tracheotomy wounds. Treitch and Abel[1] (quoted by Flexner) and Scheller[1] also mentioned examples of wound infection. Further instances of this type of affection have been cited by Paterson,[4] and Abel[2] of the finger; Sowade,[5] of the right deltoid; Place,[6] on and surrounding the vulva; Gerloczy[2] found the infection in the left inguinal region and Schwab,[2] in the genital region.

*Ulcerative Type.*—Although most of the cases of this variety have developed false membranes, there have been some exceptions. Jack[7] had a patient, the mother of a child with nasal diphtheria, who developed at the site of a trauma above her left elbow a red spot which ulcerated. The diphtheria organism was found in this lesion. Heelis and Jacob[3] found diphtheria bacilli in an ulcer on the dorsum of the right hand. The latter infected the outer canthus and from this the disease spread to the conjunctiva. Kanthack and White[1] found the bacillus in phagedenic ulcers of the neck.

*Gangrenous Type.*—Gangrene of the skin has been reported by Bolton,[8] Dawson[9] and Marschalko[10] by the implanting of the diphtheria bacillus. Pernet[11] had an infant with gangrenous lesions on the side of the anus. The little patient developed difficulty in deglutition and finally died of paralysis of the diaphragm. Virulent diphtheria bacilli have been found by Steffens[1] in a case of gangrene of the eyelid. Freymuth and Petruschnky[12] have found the Klebs-Loeffler bacillus in cases of noma.

4. Paterson: Med. Times and Gaz., 1866, ii, 608.
5. Sowade: Arch. f. Dermat. u. Syph., 1912, cxiii, 1039.
6. Place: Boston Med. and Surg. Jour., 1910, ii, 730.
7. Jack: Brit. Jour. Child. Dis., 1913, x, 456.
8. Quoted by Dawson: Brit. Med. Jour., 1910, ii, 859.
9. Dawson: Brit. Med. Jour., 1910, ii, 859.
10. Marschalko: Arch. f. Dermat. u. Syph., 1909, xciv, 379.
11. Quoted by De Verbizier: Ann. de dermat. et de syph., 1912, p. 82.
12. Quoted by Kautlack, following Todd's article (Lancet, London, 1898, i, 1458).

*Eczema-Like Type.*—Richard[13] had a young girl with a patch of eczema for some years below the left ear, which spread and attacked the commissure of the left lip. The bacillus of Loeffler was found. Her sister developed a typical case of diphtheria. Glucksmann[1] found the diphtheria bacillus in five cases with an eczema-like outbreak. Baginsky[2] has reported cases of cutaneous diphtheria developing on patches of eczema.

*Tumor and Abscess Types.*—Müller[13] described the cases of two children, a brother and sister. The girl had a tumor on the left labium majus extending to the inguinal region; there was also throat diphtheria present. The brother also developed diphtheria of the throat and a swelling at the root of the nose. Both children died and microscopic examination showed numerous diphtheria bacilli in the tumors. Deutschlander[14] has collected reports of forty-eight similar diphtheritic tumors from the literature.

Hála[1] found virulent diphtheria bacilli in an abscess of the eyelid. Councilman, Mallory and Pearce[1] found diphtheria by culture in four out of ten cases of cervical abscesses developing in the course of diphtheria. Schottmüller[1] isolated non-virulent diphtheria bacilli from the pus of an inguinal abscess and from the throat of a boy suffering with diphtheria. Tavel[1] has found the Klebs-Loeffler bacillus in abscesses. Leary discovered the diphtheria bacillus in an abscess which developed about a hair-follicle two days after a necropsy in a case of diphtheria.

*Unclassified Types.*—Bokay[2] has recorded instances of skin diphtheria and diphtheritic balanitis and vulvitis. G. C. Garratt[3] has written on acute diphtheritic whitlow. Heelis and Jacob[3] found the diphtheria bacillus in broken chilblains in children associated with faucial diphtheria.

Pitts[1] recorded an instance of diphtheria of the umbilicus in a child 4 days old, and Caddy,[1] a case of diphtheria of the nipple and areola of a woman suckling an infant, which shortly afterward developed diphtheria.

Wright[1] found the Klebs-Loeffler bacillus in a case of anal fistula.

*Impetiginous Eczema-Like, Impetiginous, Ecthymatous, Pustular, Vesicular and Bullous Types.*—These vesicular, bullous, pustular and crusted types constitute varieties of diphtheria of the skin which have only recently been recognized as such and are of rare occurrence. In all intractable cases in which these lesions are present, careful cultural tests should be carried out.

Todd[15] recorded the occurrence of six cases, out of fifty-one of external rhinitis due to the Klebs-Loeffler bacillus, in which secondary pustules developed on the skin. These pustules when examined at an early stage contained the diphtheria bacillus.

Slater[16] reported a case in a girl of 13 with a large number of vesicles, resembling varicella, some of a crescentic arrangement and with a profuse discharge. The condition had lasted for three years. The diphtheria bacillus was isolated from cultures. Antitoxin cured the patient.

Dawson[9] recorded a case in a man of 58 who showed groups of bullae on an erythematous base, resembling dermatitis herpetiformis, from which virulent diphtheria bacilli were recovered.

13. Müller: Deutsch. Arch. f. klin. Med., March 1, 1913.
14. Quoted by Müller (Footnote 13).
15. Todd: Lancet, London, 1898, i, 1458.
16. Slater: Lancet, London, 1908, i, 15.

Place states that he has had cases in which impetigo-like lesions developed on the face and the hands, in which diphtheria bacilli were found, associated with diphtheria of the respiratory tract.

Labbé and Demarque[11] recorded an instance of disseminated impetiginous eruption in a child of 4, accompanied by several sharply marginated ulcers. The Klebs-Loeffler bacillus was present. They also reported a second case, in a child of 2½, with diphtheritic impetigo-like lesions on the face and the scalp and excoriations on the lips.

Goodall and Washbourn[9] have cited instances with diphtheritic pustules yielding thin pus and producing ulcers, slow to heal and often free from membrane.

Eddowes and Hare[17] recorded a bullous and pustular case in a girl of 11. The lesions were found on the arms, the hands, the lips, and one lesion on the left anterior pillar of the fauces. There was no false membrane present. Klebs-Loeffler bacilli were found. They reported another case, in a woman of 41, of three years' duration, with lesions of an impetiginous aspect.

Douglas Heath[11] observed a somewhat generalized diphtheritic eruption of an impetiginous type.

Brandal, Herley and S. Edin[11] recorded a lesion of a pustular carbuncular type in which they found the diphtheria bacillus.

Jéz[1] found virulent diphtheria bacilli in the fluid from the vesicles of herpes labialis in a patient suffering with diphtheria. Dávelos[1] discovered the organism in the fluid of impetiginous lesions covering the face and the neck of a baby.

Prescott[1] reported a case of a child in which a blister was raised by the application of a plaster, a false membrane formed and the diphtheria bacillus was found; no bacilli were found in the nose and the throat although the child had recently recovered from diphtheria.

Waelsh[1] described diphtheria-like bacilli, pathogenic for rabbits and guinea-pigs, in a pustular eruption of the skin of the trunk. Müller found diphtheria bacilli in a pustule on the nates.

Schucht[2] recorded an instance of infantile ecthyma, with sharply marginated ulcers, and a purulent discharge from the ear, in a child of 3, in which the organism was found.

Verbizier[18] cites ten cases, in which nine did not have the membrane or other usual manifestations of diphtheria. All but two of the cases occurred in infants. Four of the cases ended fatally. Seven among those recorded were of the impetiginous eczema type, and in three, vesicles and bullae gave rise to an abundant discharge. Four showed a grave conjunctivitis. The most common form, and, therefore, the most typical type observed in infants, had the appearance of an impetiginous eczema, affecting almost always the head and the face, and associated with a grave conjunctivitis, sometimes also an otorrhea and rhinitis, the whole forming a distinct clinical entity.

The two following cases were first seen by us Sept. 5, 1913.

Case 1.— Lillian J. W., aged 4 years, had always been healthy and well nourished, and is plump and well built. Three days before she came under observation the outbreak appeared on the body, with an accompanying sore throat. There were observed on the trunk, the extremities and the buttocks two dozen pustular and bullous lesions varying from a pea to a pigeon's egg in size. The lesions were discrete and of a whitish-yellow to an orange-yellow color. The large bullous lesions had an inflammatory areola, and on rupture were found to be multilocular and filled with a thick, cheese-like, yellow pus. The throat was swollen, the glands of the neck enlarged, the patient restless and there was a high temperature. Examination showed membranous, white patches on both tonsils. Cultures were made from an unruptured lesion on the lower abdomen and also from the throat. Diphtheria bacilli were obtained from each location, the one of Type D and the other of Type C, according to Wesbrook's classification. Staphylococci were also found in the cultures. The patient was given 3,000 units of antitoxin and was sent to the Municipal Hospital. Death ensued two days later.

Case 2.—Mary W., sister of Patient 1, aged 8 years, who had been unusually free from sickness, developed, the day previous to our visit, sore throat and an eruption on the skin. The right tonsil was covered by a white membrane. The temperature was moderately high. Scattered over the trunk and the extremities were about a dozen lesions, mostly pea in size but a few with the proportions of a hazelnut. They were of the same character as her sister's; the inflammatory areola, however, was less marked and the contents were of a thinner consistency. Cultures were made from the tonsil and from an unruptured lesion on the leg. Diphtheria bacilli were found in each, corresponding to the C type of Wesbrook. Staphylococci were also found. The patient was given 1,250 units of antitoxin and was transferred to the Municipal Hospital. Although the little patient developed scarlet fever while in the hospital, she finally recovered.

The Klebs-Loeffler bacillus varies considerably in regard to its virulence both in the patients attacked and in the animal experiments. Abel, Neisser and Marschalko obtained positive results in their animal inoculations. The diphtheria bacillus obtained from Slater's case killed the guinea-pig. A pure culture of the Klebs-Loeffler bacillus obtained from Leary's case was inoculated into a guinea-pig and killed the animal in forty-eight hours. Eddowes and Hare inoculated 2 cm. of the serum suspension of the culture of the Klebs-Loeffler bacillus found in their case into a guinea-pig, and death occurred in twenty-seven hours. The organism was recovered from the guinea-pig.

Extensive cultural experiments made by numerous investigators demonstrated the fact that other pathogenic organisms are almost invariably associated on serum cultures with the diphtheria bacillus; although the streptococci are the most frequently associated, pyogenic cocci, staphylococci and pneumococci may also be found. Eddowes and Hare found in their case the *Staphylococcus aureus* and streptococci associated with the diphtheria bacilli. We found staphylococci in addition to the diphtheria bacilli in our cases.

### DIFFERENTIATION OF THE DIPHTHERIA BACILLUS AND THE PSEUDODIPHTHERIA BACILLUS (BACILLUS OF HOFMANN)

In an unusual type of lesion in which a diphtheria-like bacillus is found it is always essential to distinguish the true diphtheria bacillus, or the Klebs-Loeffler bacillus, from the pseudodiphtheria bacillus, or the bacillus of Hofmann.

The pseudodiphtheria bacillus is generally much shorter than the common forms of the diphtheria bacillus; it usually is a short, straight, oval bacillus, with rounded ends, and one median, lightly stained transverse septum. The former in proportion to its length is much broader than the latter, and the widest part, which is about equal to one-eighth of the length,

17. Eddowes and Hare: Lancet, London, 1908, i, 282.
18. Verbizier: Ann. de dermat. et de syph., 1912, p. 82.

is at the middle. Some of the forms of the Hofmann's bacillus are clubbed and often slightly curved but take the stain more deeply than the diphtheria bacillus. Sometimes after forty-eight hours' growth on the culture-medium the bacilli are even shorter than at an earlier period.

Metachromatic granules (polar bodies) are rarely found in any of the forms. In young cultures of Hofmann's bacillus, in those thirty-six hours or older, polar bodies are occasionally found, especially in the larger forms, but they are seldom so sharply defined as in diphtheria bacilli and are frequently ovoid and elongated. In Klebs-Loeffler bacilli, according to Denny,[1] polar granules are first seen as very minute objects after eight hours' growth, but do not become abundant until cultures have been growing for fifteen hours. They are found most frequently produced in cultures incubated at from about 34 to 36 C. (93.2 to 96.8 F.). Clubbing and segmentation are marked features.

Neisser's special stain should be used in the demonstration of these granules.

NEISSER'S SPECIAL STAIN[1]

| | |
|---|---|
| *Solution 1:* | |
| Methylene blue (Grübler), 1 gm., dissolved in alcohol (96 per cent.) | 20 c.c. |
| Distilled water | 950 c.c. |
| Glacial acetic acid | 50 c.c. |
| *Solution 2:* | |
| Bismark brown | 2 gm. |
| Boiling distilled water | 1,000 c.c. |

Solution 1 is used for from one to three seconds and solution 2 for from three to five seconds. The polar bodies are stained dark blue and the protoplasm brown.

Hofmann's bacillus begins to develop at a lower temperature (18 C. or 64.4 F.) than the diphtheria bacillus and the growth is more luxuriant. The former shows a whiter, softer, larger, and usually flatter growth than the latter on Loeffler's serum. The growth being more rapid, the colonies attaining considerable dimensions in the first twenty-four to forty-eight hours.

Hofmann's bacillus also shows a larger and whiter growth on alkaline serum; is more abundant on nutrient agar and glycerin-agar; shows a larger growth both on the surface and along the needle-tract in stab-cultures, more abundant on gelatin; on broth causes an earlier diffuse clouding of the medium and a greater alkalinity (acid is never produced); in glucose broth neither gas nor acid is produced, and there is an increase in the alkalinity; it does not produce acid even after prolonged growth in broth or Hiss' medium containing glucose, lactose, maltose, galactose, saccharose, levulose, dextrin, mannite or glycerin.

The diphtheria bacillus, in cultures from 36 to 48 hours old, shows the polar bodies much enlarged and occupying a large part of the club-like dilatations of the organisms; the polar bodies appear to be increased in number as well as in size, so that several are found in each bacillus.

The diphtheria bacillus in broth splits the meat-sugar contained in ordinary broth, producing acid, and thus changes the reaction of the medium, making it less alkaline, or even slightly acid. Roux and Yersin were the first to demonstrate these changes.

In glucose broth the diphtheria bacillus makes the culture-medium acid. This phenomenon was observed with glucose (dextrose), galactose, levulose and glycerin.

Lubowsky[1] suggested the differentiation of the two organisms by an immunization of animals with the non-virulent bacilli and tested the agglutinating properties of their serum to the diphtheria bacillus and Hofmann's bacillus, the former alone causing agglutination.

As a last resort in differentiating the two organisms, animal inoculation may be carried out, the diphtheria bacillus causing the death of a guinea-pig within from one to four days, while the bacillus of Hofmann proves innocuous.

### CLASSIFICATION OF DIPHTHERIA BACILLI

Diphtheria bacilli have been classified in various ways. The one followed in the laboratories of the Philadelphia Board of Health was devised by Wesbrook.

Wesbrook, Wilson and McDaniel[1] classify the organism according to its morphologic types, three main groups being used.

Group 1, Granular Forms: There are distinct spherical, ovoid or markedly rounded granules present. They label the forms from A to G. In each variety, excepting B, the granules show metachromatism. The granules are fairly uniformly found at one or both poles of the bacilli. The protoplasm not included in the granules stains with a much less intensity than the latter bodies.

Group 2, Barred Forms: These are distinguished by their irregularity of staining; bacilli present a distinct barred appearance as if segments of protoplasm had been actually removed. The darkly stained portions vary considerably in staining reaction both in different bacilli of the same variety and even in the individual bacillus. They vary in size and shape; metachromatism is not suggested. The number of dark segments varies from three to nine. Types $A^1$ to $G^2$

Group 3, Solid Color Forms: The organisms are of a solid or uniformly staining shape and size, and also some have the appearance of diplococci. Types $A^2$ to $G^2$

In the cases which we have reported above, Type C was present in one and Types C and D in the other. In other words, the organisms corresponded to Group 1, the granular form; Type C is of a curved shape, in which the protoplasm stains lightly excepting at the poles and occasionally at one point between the poles, where rounded, rarely ellipsoid metachromatic granules occur. This is the most common form encountered in the clinical cases. Type D is similar in most respects to C, but shorter, thicker and apparently straighter; the former is from 0.75 to 1 micron in thickness and from 2 to 3 microns in length, showing metachromatic granules at both poles and none in the center, and the latter is from 3 to 6 microns in length and from 0.5 to 1 micron in thickness, with both central as well as polar metachromatic granules.

### CONTAGIOUSNESS OF DIPHTHERIA

It is extremely important to recognize diphtheria of the skin because of its contagiousness. Loeffler[1] found that bacilli from cultures dried on silk threads were viable for from three to four weeks; from small dried pieces of membrane he was able to obtain living bacilli in large numbers at the end of from four to nine weeks, and isolated colonies after thirteen to sixteen weeks; after sixteen weeks they could never be cultivated. From membrane dried on pieces of linen

and kept in the dark at room temperature, Roux and Yersin[1] were able to obtain numerous colonies at the end of three and four months. Abel[1] demonstrated living bacilli on a toy six months after the child was infected. The latter also has found bacilli sixty-five days after the disappearance of the membrane. Diphtheria bacilli have been found on pillows and bedclothes (W. H. Park[1]), on a sweeping-broom (Wright and Emerson[1]), on a drinking-glass in common use (Forbes[1]), and on a sucking-bottle (Weichard[1]).

SUMMARY

Diphtheria of the skin may occur in several forms, in addition to the false-membrane type, the ulcerative, gangrenous, eczematous, impetiginous eczema-like, pustular, impetiginous, ecthymatous, vesicular (varicella-like), bullous, dermatitis herpetiformis-like, tumors and abscesses. Our two cases were of the bullous impetigo type, one terminating fatally.

Inoculation of the skin occurs by auto-inoculation, by means of infected articles, and from one person to another. It may occur primarily on the integument, remain limited to it, spread to the mucous membranes, or, more commonly, is secondary to throat, nasal or laryngeal diphtheria.

In cases of diphtheria of the skin the Klebs-Loeffler bacillus always has to be distinguished from the pseudodiphtheria bacillus (Hofmann's bacillus).

These two organisms differ somewhat morphologically, culturally and in animal inoculations. The diphtheria bacillus is particularly distinguished by the metachromatic granules (polar bodies), as shown best with the Neisser stain, by the acid-producing qualities, and by the fatal results on inoculating animals.

Diphtheria bacilli are grouped according to the Wesbrook, Wilson and McDaniel classification.

These diphtheritic skin-lesions are a constant source of contagion, because they are frequently unrecognized for a considerable period. They may last over a long period or run a rapidly fatal course.

We wish to express our thanks to Dr. C. Y. White for assistance in the bacteriologic study and to acknowledge our indebtedness to the excellent chapters of G. S. Graham-Smith, in "The Bacteriology of Diphtheria," by G. H. F. Nuttall and G. S. Graham-Smith.

2022 Spruce Street—3944 Aspen Street.

## ABSTRACT OF DISCUSSION

Dr. Henry C. Baum, Syracuse: In a case bearing on this subject, the patient, a boy 11 years old, was admitted to our orthopedic ward with a discharging sinus of the hip-joint, near which were a number of vesicles and vesicopustules. When my attention was called to the case, a few days after admission, there was some elevation of temperature, and a culture made from the contents of the vesicles showed the Klebs-Loeffler bacillus. Throat cultures were negative, but we learned that the boy had been taking care of his little brother, who was suffering from laryngeal diphtheria. A number of cases of diphtheria subsequently developed among the children in the orthopedic ward. I have never made a search of the literature with regard to this subject, but have no doubt that diphtheria of the skin is of more frequent occurrence than is generally supposed, and probably some of us have overlooked such cases in the past.

Dr. Martin F. Engman, St. Louis: The subject of diphtheria of the skin is very important when one considers the number of cases that probably occur after diphtheria. Not only immediately, but possibly some little time after an attack of diphtheria the patient is probably a diphtheria bacillus carrier, and various methods have been devised to destroy the local foci in these carriers. I have seen several cases of impetigo-like and eczema-like eruptions after diphtheria in which the bacilli were found in the skin lesions. Some years ago possibly ten, a very sad case came under my observation. A child had recovered from diphtheria and shortly afterwards developed an aural discharge, with some eruption about the ear. A child played with this patient, was stricken with diphtheria and died. The discharge from the eruption about the ear was then examined, and was found to contain the Klebs-Loeffler bacilli. These eruptions are observed not only after diphtheria, but also after many catarrhal conditions of the nose and throat, and after measles and grip, and it is well to examine bacteriologically any eruption about the mouth or ears. This bacillus varies so widely in its morphology and virulence, that the subject is really important from many points of view.

Dr. M. Haase, Memphis: What was the duration of the skin lesions in the two cases reported? If they occurred immediately after an attack of diphtheria, it was not surprising to find the bacilli in the skin eruption.

Dr. A. Ravogli, Cincinnati: Before the introduction of Behring's antitoxin, I frequently saw cases of diphtheria eruption of the skin, especially about the lips and mouth, and sometimes near the genitals, but since the use of antitoxin I do not recall a single case of this kind. In the cases I formerly saw we used Monsell's solution with excellent results.

Dr. H. N. Cole, Cleveland: Drs. Knowles and Frescoln justly laid much stress on the presence of the pseudo-diphtheria bacillus in a number of cases. In a series of several hundred routine cultures in cases of eczema, impetigo and dermatitis of the skin, this organism was encountered a number of times and it is very important to differentiate it from the diphtheria bacillus. The Neisser stain is the only one by which the distinction can be made.

Dr. Leonard D. Frescoln, Philadelphia: The cultures from the throat and from the skin were practically identical and one could not tell which was which. In connection with this subject of properly diagnosing possible infective lesions of the skin, three classes of skin infections should be kept in mind: First, those due to the Klebs-Loeffler bacillus; second, chancroidal infections in various parts of the body, and, third, deep ring-worm lesions. The possibility of a patient being a diphtheria carrier should not be lost sight of. In one case that came under my observation, the patient, a hospital nurse, made some complaint of her nose, and with the postnasal mirror a patch of diphtheritic membrane, typical in appearance and containing Klebs-Loeffler bacilli, was found. That nurse was certainly a diphtheria carrier.

Dr. Frank Crozer Knowles, Philadelphia: In one of the two cases we reported, the lesions had been present for four or five days before the patient came under our observation and in the other case only one day. We recently had an interesting pseudodiphtheria case at the Pennsylvania Hospital. The patient had an eczematous eruption on the back of the neck and shoulders, and on taking a culture, we found a pseudodiphtheria bacillus. An autogenous vaccine was made and injected and the patient recovered within a week.

---

**Price of Radium.**—According to Thomas Stephenson (The *Prescriber*, July, 1914), the price of radium, which has recently stood at about £20 (about $100) per milligram, has shown signs of being reduced. Stephenson states that he was informed on good authority quite recently that radium salts could be obtained at £13 (about $65) per milligram, but the strength of these is not stated. As the value of radium salts depends on the amount of the element radium they contain, the price must be reckoned not only on the degree of purity of the salt but also on the combining weight of the element with which the radium is combined. Thus pure radium bromid is worth less per milligram than pure radium chlorid because the bromid contains a smaller percentage of radium because of the greater atomic weight of bromin as compared with chlorin.

## LEAD-POISONING WITH PARALYSIS OF THE EXTERNAL OCULAR MUSCLES

EDWARD MERCUR WILLIAMS, M.D.
SIOUX CITY, IOWA

Paralysis of the extra-ocular muscles is a condition very rare in lead-poisoning. I recall seeing it in only one other case, that of a male attendant at the East Oklahoma Hospital for the Insane. He had to give up his work as a painter several years previously on account of his illness. When I examined him he had, as residual signs of the disease, a partial double wrist-drop and bilateral ptosis, more complete on one side, on which side also the internal rectus muscle was partially paralyzed, sufficiently so to interfere with his accommodation.

In the present case in addition to the paralysis of the right external rectus there were unusually widespread and intense atrophic muscle-changes and absence of basophilic degeneration and of the characteristic lead-line on the gums.

While the external rectus was only partially paralyzed, the paralysis was sufficient to cause double vision when the patient worked in a poor light. I have had several patients with slight or partial ocular paralysis in whom the double vision occurred only in dim light. I have never seen this referred to. Possibly it is due to the extra impulses necessary to accommodation in a poor light, causing a proportional overworking of the healthier muscles.

The usual symptoms of lead-poisoning are so well known and have been so ably described by a recent writer[1] that their repetition is hardly necessary. It might be well, however, to emphasize the fact that insidious cases of plumbism may go for a long period unobserved. Particularly when the occupation and life of the patient is of such character (as in this case) as to necessitate very little muscular exertion.

*History.*—Woman, single, aged 36, typesetter for last six or eight years, has not had any abdominal pain since an acute attack of doubtful character two years ago. Also she did not notice any weakness of her muscles until the present acute attack, beginning three weeks before the examination. She then complained of rheumatism, had severe pains in all her limbs, and her leg- and arm-muscles became weak. These increased until she became bedfast in a couple of weeks.

*Examination.*—Pupils were equal, regular in outline and reacted promptly to light and accommodation. The right abducens was very weak and the patient said that she had often noticed double vision when working in a poor light. At time of examination she had double vision on being tested in extreme lateral field. Almost all the muscles of the body seemed weak and wasted. Fibrillary tremors were present in the thigh- and shoulder-muscles. The arms were both very weak, the right more than the left. The forearm extensors were completely paralyzed on the right, but on the left the patient retained the power of extending the index-fingers and little fingers. The supinator longus was slightly impaired on the right. The right upper arm, biceps, triceps and shoulder-muscles were paralyzed. Reflexes were absent on right and very weak on the left. The left upper arm- and shoulder-muscles, while decidedly atrophied, still retained some power. The forearm flexor groups on each side were only slightly affected. Both legs were very weak, the patient being able to bear her weight with great difficulty and only when assisted. She could not rise from a sitting posture. There was double toe-drop and the atrophy of the leg-muscles, with the exception of the greater involvement of the foot extensors, seemed to affect all the musculature about equally. Reflexes present, but greatly diminished; no Babinski; no sensory changes nor tenderness of the nerve-trunks.

The blood examination did not show any basophilic degeneration.

The characteristic blue line on the gums was not present, though there was a peculiar blackish discoloration of the lower decayed portion of one or two of the teeth.

The patient's mental condition showed some deterioration.

1. Linenthal, Harry: The Early Diagnosis of Lead-Poisoning, THE JOURNAL A. M. A., June 6, 1914, p. 1796.

## FOREIGN BODY IN THE SUBMAXILLARY GLAND

WILLIAM H. SMITH, M.D., AND NORMAN T. KIRK, M.D.,
Captain and First Lieutenant, Respectively, Medical Corps, United States Army
WASHINGTON, D. C.

W. C. C., a soldier of the Twenty-Second Infantry, was on a maneuver problem near Texas City, Tex., Sept. 11, 1913. He plucked a piece of grass from along the roadside and put it in his mouth. A small piece of the grass, about ¾ inch long, consisting of the bearded seed-tufts, got under his tongue and entered the orifice of the left Wharton duct. The soldier felt a slight sticking sensation under his tongue, but did not realize what had happened, at the time. The submaxillary gland began to swell in about an hour, and in twenty-four hours it was twice the normal size. There was no acute pain.

The condition remained about the same from Sept. 11 to Nov. 27, 1913, the patient being free of pain in the interim. During this time he had been treated occasionally for a mild inflammation, with local applications of iodin, etc. Nov. 27, 1913, he began to suffer with pain and pressure symptoms, and was transferred to Field Hospital No. 3, for observation and treatment. Here his history was gone over carefully and he was observed for a few days. He suggested that the grass was the obstrusive agent, but the possibility of it having traversed the duct seemed so remote that we attached no credence to the soldier's statement.

The duct was explored for calculi and stenosis, but was found patent throughout its course. We were unable to determine what was the cause of the glandular involvement.

Dec. 3, 1913, the glandular tumefaction became more marked and there was extensive periglandular cellulitis, accompanied with fever and pain. We decided to excise the gland before suppuration ensued.

The gland was removed *in toto*, and when it was excised, a piece of grass (seed-tufts) ¾ inch long was found embedded in one of the ramifications of the excretory duct. There was slight necrosis of the glandular tissue, where the grass was imbedded. The concomitant cellulitis of the neck subsided in forty-eight hours, and the wound healed by first intention.

**Plum-Stone in Rectum Causing Inability to Micturate on Account of Pain.**—I was called to see a man, aged 34, who said that on the morning of the day on which he was seen, although he had frequent desire to urinate, he was unable to do so and the attempt produced sharp pain in the anus. in the anus became more severe with each attempt to void urine. There was no history of similar trouble. Abdominal examination showed a distended bladder and on rectal examination a plum-stone was found, lying point down between the sphincter internus and the sphincter externus, with the point embedded in the sphincter externus. Removal of the foreign body gave immediate relief and in a few minutes the patient voided over 30 ounces of urine. The plum-stone had been swallowed forty hours prior to the onset of symptoms.—W. F. DEY, M.D., La Grange, Ill.

**Anthropologic Research in Portugal.**—The facial index as studied on 585 craniums is discussed from various points of view in the big quarterly, the *Revista da Universidade de Coimbra*, 1914, iii, 314.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 North Dearborn Street . . . Chicago, Ill.

Cable Address . . . . "Medic, Chicago"

Subscription price . . . . . Five dollars per annum in advance

*Contributors, subscribers and readers will find important information on the second advertising page following the reading-matter.*

SATURDAY, AUGUST 1, 1914

## THE NUTRITION OF THE NEW-BORN

During the first few days after birth the human infant experiences a well-known decrease of body weight, which is generally regarded as an entirely physiologic consequence. The average weight of the new-born male approaches 3,500 gm. (8¼ pounds); that of the female infant 3,200 gm. (8 pounds). The initial loss of weight which continues for two or three days as a rule may amount to 250 gm. or over, ranging usually between 150 and 200 gm. In explanation of the phenomenon it is ordinarily conjectured that the natural supply of nutriment soon after birth generally is inadequate. The discharge of the meconium, which may not take place until some interval after birth, is an added reason for a drop in body weight. Under normal conditions the original weight at birth is regained again by the child at the end of from eight to fourteen days; and subsequently the increments in size characteristic of growth proceed in health without interruption. Continued loss of weight or even cessation of growth with stationary conditions at this period must be looked on with suspicion. Frequently they are indexes of some pathologic condition; but when they occur in comparatively early life they merely represent a sort of inanition attributable to inadequate secretion of milk by the mother.

In a series of observations made in the maternity wards of Bellevue Hospital in New York City, Bailey and Murlin[1] found that the initial weight loss there averages over 250 gm., and that this loss is increased by lengthening the interval of feedings and lessened by the supplementary feeding of a milk mixture similar to colostrum. The infants were able to take the extra feedings without any disturbances of digestion. This has raised the question whether it would be desirable from a physiologic standpoint to furnish some artificial food together with the colostrum during the first three days of life. Analyses of second- and third-day colostrum show that its utilizable heat value averaged 65 calories per hundred cubic centimeters. To offset this pronounced food value, it appears that the average amount of breast secretion is only 14 cubic centimeters on the first day, 77 cubic centimeters on the second day, 173 cubic centimeters on the third day and from that time on gradually increasing to 372 cubic centimeters on the sixth day, hardly, in the first three days at least, an amount that would give the infant much nourishment.

Bailey and Murlin have determined the actual energy requirement of the new-born by means of a respiration incubator. The respiratory quotient reaches as high as 1.0 on the first day of life and indicates the combustion of carbohydrates. Thereafter it drops to 0.67 on the second day and remains in the neighborhood of 0.70 for the following two days indicating a condition of starvation and the combustion of fat. After the milk secretion is well established, the quotient reaches 0.90, which is the normal for a mixed diet. The average food requirement for combustion alone during the first four days of life for a large infant weighing 4.5 kg. is 1.7 calories per kilogram per hour; and for a small infant weighing 3 kg. is 2.0 calories per kilogram per hour.

Comparing the calories per hundred cubic centimeters of samples of colostrum with this requirement, the New York investigators make it evident that the infants would have to suckle at least 30 cubic centimeters at ten feedings. This is an amount that the breast does not secrete, at least until the fourth day. They conclude that feeding the new-born infants for the first three days, in addition to the breast secretion, a formula of about the same composition as colostrum would appear to be a logical proceeding not only to fulfil the energy requirement but also to supply the water lost. Even after the breasts are secreting a considerable quantity of milk, it would seem to be rational to feed these babies as often as every two or two and one-half hours during the day or eight or nine feedings in all. The suggestions here raised may seem radical to those who have looked on some of the earliest unfavorable nutritive experiences of infants as inevitable and physiologic. Perhaps they will now inaugurate a useful departure in the practical aspects of infant nutrition at this beginning of the period of growth.

1. Bailey, H. C., and Murlin, J. R.: The Energy Requirement of the New-Born, Proc. Soc. Exper. Biol. and Med., 1914, xi, 109.

## UROBILIN

A group of derivatives of blood and bile pigments, containing the pyrrol nucleus, has become familiar in medical literature under the name "urobilin." That these substances have proved unsatisfactory as an aid in diagnosis and prognosis is no more than has been found true of many other supposedly characteristic functional tests in the disorders of individual organs. Many of the facts elicited by the study of abnormal conditions in the body are of decided value in diagnosis; the limitations are found when attempts are made to render certain reactions specifically and unreservedly applicable to some special pathologic

situation. Even the variations in the secretion of a substance so specific as the hydrochloric acid of the gastric juice cannot always be charged to local organic or functional defects of the stomach mucosa; for not a few failures of proper secretory performance on the part of the gastric mechanism are caused by remote factors such as perverted nervous states.

The theories which have been advocated with respect to the origin and clinical significance of urobilin have been reviewed in elaborate detail by Drs. Wilbur and Addis[1] of the department of medicine in the Leland Stanford Junior University. There is at present no common agreement on all the points involved. The theory long maintained by Friedrich von Müller that urobilin originates from the bacterial decomposition of bile in the intestine is generally accepted. But whether urobilin may also at times have a non-enterogenous origin — whether or not it may be formed in the liver itself, or can be produced in the tissues directly or indirectly from hemoglobin — these and other questions have been raised and tentatively answered again and again. As the California clinicians remark, when such variable factors as the bacterial changes within the intestine, the absorption from it, the activity of the liver, the elimination of bile, the secretory power of the kidneys, the rate of destruction of the red blood-corpuscles, the activity of the spleen, etc., have been taken into account, it is not surprising that difficulty should arise in interpreting the findings and in correlating the ideas obtained in the laboratory with those gained at the bedside.

The formation of urobilin from the decomposition of bile within the bowel is admittedly the usual mode of origin of urobilin and urobilinogen, which may then be absorbed into the portal system and thus reach the liver. If this organ is normal the major portion of the urobilin is either destroyed or resynthesized to bile or blood pigment. When the liver parenchyma is damaged, these changes in the urobilin may not occur, and consequently the substance passes into the general circulation and is eliminated by the kidneys. On this ground the existence of pronounced urobilinuria has been interpreted as indicative of severe hepatic disorder. In the complete closure of the common duct caused by carcinoma, for instance, there is usually absence of urobilin from the urine, bile and stools.

Wilbur and Addis further accept the evidence that the diseased liver may originate urobilin either directly as a product of its cells, or indirectly from decomposition of bilirubin within the bile-passages. Patients in whom no bile is reaching the intestine may nevertheless show urobilin in large amount in the bile, and to some extent even in the urine and stools, if the liver itself is diseased or functionally deficient. The urobilin excreted in the urine and stools of such patients must be derived by the blood from the liver. Again, an increased quantity of urobilin in the stools indicates increased blood destruction. In such cases the excessive amount of urobilin in the urine is not caused by any obvious disease of the liver; but from the increase of urobilin carried from the intestine to the liver, enough reaches the kidneys to lead to an obvious urobilinuria.

The primary feature to be emphasized is that there is a close association between increase of urobilin in the urine and a disturbance of liver function. But, Wilbur and Addis conclude, even if increased blood destruction is excluded by estimations of urobilin in the stools, it is not at present possible to regard the amount of urobilin in the urine as an approximate guide to the functional efficiency of the liver. The occasional occurrence of large amounts of urobilin in the urine of patients in whom there is no reason to suspect damage to the liver, the great and irregular fluctuations of urobilin excretion from hour to hour and from day to day in cases of liver disease, and the want of knowledge as to the fate of urobilin in the blood and tissues, make it necessary to recognize that other factors than the condition of the liver and the amount of blood destruction may influence the excretion of urobilin in the urine. To evaluate these correctly for purposes of diagnosis still remains as a worthy task for the workers in clinical medicine to accomplish.

1. Wilbur, R. L., and Addis, T.: Urobilin: Its Clinical Significance, Arch. Int. Med., February, 1914, p. 235. An elaborate bibliography is appended to the paper.

## MILITARY SURGERY IN THE BALKANS

Octave Laurent, surgeon of St. John's Hospital, Brussels, who followed the troops in the Balkans for eleven months, has issued a volume[1] on the war in Bulgaria and Turkey from the point of view of a surgeon which is interesting as the most recent evidence on the fatality of modern arms and the problem of care for the wounded which follows modern battles. It contains a discussion of most of the unsettled problems as to whether the artillery or the infantry is most deadly and which is the more crippling for the moment. Laurent emphasizes above all the fact that military surgeons cannot be improvised out of the ordinary surgeons of civil life, but to be really life saving in their efforts they must have seen special service and had particular experience with gunshot wounds and military conditions.

At the beginning of the Balkan war, Bulgaria had a population of about 4,300,000, and put into the field more than 500,000 soldiers. In the first war 30,000 were killed and about 53,000 wounded. In the second war 16,000 were killed and 62,000 wounded. Thus one third of the effective force of the entire army, or 3 per cent. of the population of the country, were either killed or wounded. The deaths reached one

1. Laurent, Octave: La guerre en Bulgarie et en Turquie, Paris, Maloine, 1914.

in twelve of the whole army, one in four of the wounded and one in a hundred of the entire population. These figures serve to give some idea of what modern war means.

In spite of the thorough training of the soldiers and the years of service to which they had been subjected, the old proverb that it takes much more than his own weight of lead to kill a man in battle held true during this Balkan war. Altogether Bulgaria used during the last war 32,000,000 rifle-bullets and 27,000,000 shrapnel balls, so that scarcely more than 1 in 200 bullets found, in the expressive phrase, its human billet. The artillery was responsible for more than half of the deaths, but less than one fifth of the wounded.

Owing to their high velocity, bullets from the modern rifle often make wounds with surprisingly few serious consequences. Laurent reports cases in which a ball traversed the brain, pierced the chest or penetrated the abdomen, with comparatively mild results. In some of these apparently dangerous cases the wounds healed promptly without any disturbing consequences or symptoms. Sometimes bones were perforated with only insignificant traces of the passage of the bullet, especially when it traversed the epiphyses. On the other hand, the fractures of the large bones were numerous and complicated and deserve special study. The mortality was distributed as follows: 55 per cent. due to wounds of the head; from 35 to 40 per cent. to wounds of the trunk, and 5 per cent. to wounds of the limbs.

Quite contrary to the usual supposition, there were extremely few serious wounds of the abdomen which called for laparotomy in the hospitals. There was a much larger proportion than might have been expected of aneurysms and especially of nerve-lesions of various kinds. Direct rifle-bullet wounds were often almost absolutely innocuous, and wounds of the head as a striking feature were followed with extreme rarity by serious deformities of the face. Amputations were rare, less than 1 per cent. of all the cases treated in the hospitals requiring it, while trephining was relatively much more frequent. The results of a second operation under chloroform of wounded soldiers whose wounds had become infected were always very discouraging.

Summing up the results, Laurent says that during the single month of July, 1913, 150,000 men were killed and wounded on both sides, and of these more than half, at least 80,000, fell on the banks of the Bregalnitsa in the six days from June 30 to July 5. He quotes with approval the remarks of a commentator on these figures who says:

> If you put a zero behind each of these numbers you will have some idea of the effective strength of the armies and the losses that must be presumed to take place in any war which would to-morrow set the armed forces of any two first-class powers of Europe on the fighting line before each other. There would be not less than 1,500,000 dead and wounded in the course of the first month.

This summary of the deadliness of modern war and prophecy as to the immediate future might very well be thought the expression of some sensational notoriety seeker, did they not occur in the midst of the story of the authoritative experiences of a distinguished Belgian surgeon, whose treatise on clinical surgery has now reached its third edition and who is an honorary and corresponding member of a number of foreign medical societies. He has given many details of the unusual cases seen in his eleven months of campaign, and a series of 300 illustrations which serve to show how serious are the conditions that develop especially from wounds of the bones and of the nervous system in modern military surgery.

## THE ISLANDS OF LANGERHANS AND DIABETES

Although the correspondence is by no means complete in all the symptomatic details, it is nevertheless admittedly true that ordinary types of human diabetes quite closely resemble experimental pancreatic diabetes. Opie, in particular, has shown that diabetes in man is frequently associated with lesions of the islands of Langerhans, whereas extensive pancreatic lesions which do not involve the islands do not cause diabetes. It is frankly admitted, however, that many cases of diabetes occur in which no anatomic changes whatever can be detected in the pancreas, and that in other cases the lesions of the parenchyma plainly preponderate over those of the islands of Langerhans.

We may well admit that carbohydrate metabolism in the body is in some way bound up with the functions of the pancreas, without being able to give a final verdict whether the acinous tissue or the islands of Langerhans are the most important epithelial elements concerned in this rôle of the gland. The conflict of opinion has sometimes seemed extremely uncompromising. Some writers have insisted on including the islands, along with the parathyroids, the epithelial portions of the hypophysis and the adrenal cortex, in the category of the "glands of internal secretion." On the other hand, from among investigators of long experience in this field, we may quote the recent conclusions of Swale Vincent.[1] "Despite whatever future study may disclose in respect to the real functions of the islands of Langerhans," he writes, "their intimate anatomic relation with the zymogenous tubules, the numerous transitional forms found in all classes of vertebrates, and the transformation of alveoli into islands and vice versa—all these facts appear to furnish conclusive evidence that the islands are not organs *sui generis*, but merely an integral part of the ordinary pancreatic tissue. Whether temporary modifications into the islet tissue represent a peculiar specialization of function cannot be regarded as demonstrated at the present time."

1. Vincent, Swale: Ergebn. d. Physiol., 1910, ix, 489.

It would be an easy task to present a large number of opinions of both earlier and later investigators dealing pro and con with the fundamental question here at issue. In such a problem negative evidence, that is, the failure to observe anatomic lesions, is as a rule less significant than concordant positive signs of disease; for doubtless alterations which are not revealed by our present microscopic technic may occur in cells and yet cannot be discovered in the usual manner of examination. The proper attitude of the passing moment, therefore, would seem to be that of an open mind ready to receive any new evidence based on the results of investigation which bears the marks of efficiency and adequate criticism. It is not enough to repeat the experimental procedures of the past and accumulate further statistical histologic evidence. Every new research must go a step farther than its predecessor, must subject every case to suitable rigorous control, must exclude known interfering factors or complicating agencies.

In many of the earlier experiments the external secretion was prevented from escaping from the pancreas. It has been thought that the sclerosis which always follows the conventional procedure of ligation of the ducts might affect not only the acini, but also the islands. Homans[2] of the Laboratory of Surgical Research in the Harvard Medical School therefore concluded to cut down very considerably the amount of pancreatic tissue, without interference with the portions adjacent to the duct of Wirsung. Under these circumstances sclerosis and atrophy would be prevented and the animal would have preserved for digestive functions a considerable though diminished amount of pancreatic juice. It was believed that the physiologic functions of the pancreatic fragment would, though unimpaired, be taxed to their maximum; that sufficient pancreas could be removed to render the animal permanently but mildly diabetic, and that at various periods following operation, the remaining portion of the gland would show some evidence of physiologic strain.

Homans concludes that the islands of Langerhans must be deeply concerned in experimental pancreatic diabetes for the following reasons: The removal of more than three-quarters of the pancreas, leaving the main duct *in situ*, usually leads to a disappearance of secretory granules in the islands, with suggestive evidence of overactivity, without the production of diabetes. The same procedure occasionally causes a degeneration of the island of Langerhans accompanied by fatal diabetes without disturbance of the remaining acinous tissue. Whatever may be the explanation of the discrepancy between the results of duct occlusion and duct patency on the islands when only a small fragment of pancreas is retained, the fact remains that if in such a fragment the external secretion is allowed to escape freely into the intestine (as it does in most cases in man) the effect on the islands of Langerhans of diminishing the pancreatic tissue is nevertheless profound. Perhaps it is not an unfair conclusion to say that the burden of proof is beginning to fall on those who fail to see in lesions of the island tissue anything pathognomonic of diabetes.

2. Homans, John: Degeneration of the Islands of Langerhans Associated with Experimental Diabetes in the Cat, Jour. Med. Research, March, 1914, p. 49.

## THE TREATMENT OF CYSTINURIA

Cystinuria may fairly be classed among the rarities of medical practice. Presumably the perversion of metabolism whereby cystin, one of the amino-acid fragments of the protein molecule, is not destroyed in the body as it is in a normal person, is not so uncommon as statistics might lead one to believe. As the metabolic disorder may exist for very long periods without revealing itself by any easily detected symptom other than the presence of the unutilized cystin in the urine, the discovery of the cases becomes more or less fortuitous. Only when urinary concretions arise to direct attention to their cause, or when the presence of cystin is detected by chance in a routine examination of the urine, does the anomaly come to the knowledge of those who are interested in its cause and treatment.

From the point of view of the patient the chief problem in connection with cystinuria is either to decrease the output of cystin or to increase its solubility in the urine—or both—with the aim of avoiding the impending danger of calculi. The pronounced insolubility of cystin in urine of the usual reaction makes the possibility of attacks of "kidney colic" and related consequences an ever-present one. It has long been known that the output of cystin can be decreased by a diminution of the metabolism of its mother-substance, protein. In the entire absence of any intake of albuminous foods, the urinary excretion of cystin is reduced to an endogenous level, represented in an illustrative case in the literature by 78 mg. a day.

The fact that cystin is soluble in alkalies led Klemperer and Jacoby[1] of the Krankenhaus Moabit in Berlin to study the results of alkali administration in cystinuria, precisely as it is sometimes practiced in urate "diathesis." In a suitable case it was observed that the deposited cystin sediment promptly decreased in amount and soon completely disappeared from the urine following the daily ingestion of from 6 to 10 gm. of sodium bicarbonate. From the point of view of preventing the precipitation of cystin and consequent formation of calculi, this treatment was evidently successful. Incidentally, it further developed that even dissolved cystin entirely disappeared from the urine as the result of the alkali therapy. The

1. Klemperer, G., and Jacoby, M.: Zur Behandlung der Cystinurie, Therapie der Gegenwart, 1914, 1-101; abstr., THE JOURNAL A. M. A., April 11, 1914, p. 1207.

explanation of this most unexpected result is by no means clear. It is known, of course, that cystin is unstable in alkaline fluids and decomposes therein. One can hardly assume, however, that the alterations, small at best, which the body-fluids can undergo with respect to alkalinity as the result of such dosage[2] are adequate to account for the profound effect noted. As yet the data are limited to a single patient and should not be made the basis of an unwarranted hypothesis. The rarity of the cases of cystinuria, however, and the prominence of the clinician and chemist who have reported the findings, are taken as a justification for the record of this seemingly unique outcome of alkali therapy.

## Current Comment

### RAILROAD WATER-SUPPLY IN MINNESOTA

The United States Public Health Service has just issued a most interesting report designated as Reprint 191, containing a summary of the inquiry into the character of railroad water-supply in Minnesota, made by the director, the assistant director and the chemist of the laboratory division of the Minnesota State Board of Health. Under the act of Jan. 25, 1913, common carriers engaged in interstate traffic are required to furnish water for the use of passengers which shall be certified to by the state or municipal health authority within whose jurisdiction it is obtained. This provision made it necessary for the state authorities to secure accurate information regarding the sources and character of the railroad water-supplies. In undertaking this investigation, each railroad in Minnesota was asked to submit a list of localities from which water was taken for drinking purposes on its trains. As the replies were received, the different localities were listed and the state divided into districts. Suitable methods for inspection of the source of the supply and analysis of the water itself were then devised. It was found that the railroads secured water for their trains from sixty-one different localities in the state. Of these, there were eleven dug wells, twenty-nine drilled wells and two driven wells. Water was taken from springs in five cases and from mine drifts or shafts in two, making a total of forty-nine cases in which the water is taken from underground sources. In nine cases surface water was used, five of the sources being lakes, three rivers and one creek, while in three cases the source was a combination of drilled wells and river, lake or spring. Regarding the results of the field investigation, in thirty cases the source of supply was found satisfactory and in thirty-one unsatisfactory, while the results of the water analysis showed the water itself to be satisfactory in forty-three cases and unsatisfactory in seventeen. This brought out the interesting fact that neither field survey nor water analysis can be relied on alone to determine the sanitary value of a water-supply. The report says: "If analytical results alone were depended upon to determine the sanitary value of these water-supplies, forty-three would have been found satisfactory and seventeen unsatisfactory. On the other hand, when the field investigation is also taken into consideration, only twenty-nine are satisfactory while thirty-two are unsatisfactory." The explanation of this apparent discrepancy is that in many cases, endorsement of the water-supply was withheld, not because the water was polluted at the time of the investigation, but because the inspection showed avenues by which pollution might easily occur. The summary of the report shows that over 50 per cent. of the supplies investigated (thirty-two out of sixty-one) could not be endorsed and that of these, thirty-one were found to be unsafe by the field investigation, while only sixteen showed analytical evidence of pollution. The report, therefore, concludes that "a careful and adequate field investigation in addition to the analytical investigation is required before a satisfactory opinion should be ventured concerning the safety of a given water-supply." An encouraging feature of the report is the final statement that practically all of the condemned water-supplies can be converted into safe supplies at a relatively small cost by following out the specific recommendations made in each case. This statement leaves no room for evasion of responsibility on the part of the railroads. Practically every railroad water-supply in Minnesota that is not already safe can be made so at a small expense. Pure water should be demanded by the public, not only on all of the railroads of Minnesota, but also on those throughout the country.

### SEEING OURSELVES AS A MEDICAL PUBLISHER SEES US

To the public all medical journals are medical journals — to the intelligent, thinking doctor, they are not. The *Medical Standard* is one of those that are not. It is published by George P. Engelhard of Chicago, a gentleman who looks at the medical profession from two angles: one, as a means of making money for Engelhard; another, as something on which to vent his spleen when defending the "patent-medicine" interests. When the "patent-medicine" men's organization—the Proprietary Association of America—met a few weeks ago in New York at its annual convention, Mr. Engelhard, as usual, was on hand and delivered an address. This address has been reprinted and is being distributed. We give some choice excerpts for the purpose of letting physicians know just what Mr. Engelhard thinks of them:

"Go once to the doctor, and you will go a dozen times. (Applause.) If you are not sick when you go, you are pretty sure to be sick before you get through."

"What high and holy character attaches to the men of the medical profession that their seal must be upon everything pertaining to the health and life of the people before it is safe?"

"It is a part of the medical ethics that a consulting physician shall never question the infallibility of the doctor who has called him in. You never find outside the sacred precincts of the medical meeting room the truth told about the doctors. They will tell the truth about themselves among them-

2. Some Newer Aspects of Acidosis, editorial, THE JOURNAL A. M. A., May 30, 1914, p. 1726.

selves but they want no hearing by or of reform from outside agencies. Anything to deify the medical man, anything to deify the function of the physician."

"The menace to American life and health to-day, I repeat, is not in the proprietary ["patent medicine"] industry . . . but the crowning menace to the health and life of the people of America to-day is incompetency or worse in the regular medical profession. (Applause.)"

And this, gentlemen of the "regular medical profession," is what George P. Engelhard, publisher of an alleged medical journal, the *Medical Standard*, and of an alleged drug journal, the *Western Druggist*, thinks of you.

## ADVERTISING BUSINESS PURIFIES ITSELF

In the news columns of a recent issue,[1] reference was made to the "*Printers' Ink* bill" for the regulation of advertising. This bill prepared originally by the *Printers' Ink* Publishing Company has now been passed by twenty states, eight of which (Ohio, Washington, Rhode Island, Minnesota, North Dakota, New Jersey, Nebraska and Louisiana) have adopted the model bill verbatim. In the other twelve (Connecticut, Indiana, Iowa, Maryland, Massachusetts, Michigan, New York, Oregon, Pennsylvania, South Dakota, Utah and Wisconsin) the model bill has been amended by the addition of the word, "knowingly," or "willingly," which materially weakens the measure. The bill has been passed by the legislature but vetoed by the governor in Maine and Colorado, defeated by the legislature in Virginia, Missouri, California, Kansas and Illinois and unfavorably reported by the committee in South Carolina. This bill was endorsed by the House of Delegates of the American Medical Association in Minneapolis in 1913. It is short but effective, providing that any person or organization making any false statement in advertising any goods for sale shall be guilty of a misdemeanor. A bill similar in intent but different in phraseology has been introduced into the House of Representatives by Mr. Kreider of Pennsylvania. This bill, known as H. R. 11016, makes it a misdemeanor for any person or organization to knowingly make or disseminate any statement concerning the quantity, quality, value, merit, use, present or former price, purpose or motive of a sale of any securities, merchandise, articles, commodity or services, or concerning the method or cost of production or manufacture of such articles or the manner or source of purchase of such articles that enter into interstate or foreign commerce which is untrue or calculated to mislead. Mr. Kreider's bill also includes the weakening word, "knowingly," presence of which makes it necessary to prove actual knowledge on the part of the advertiser in order to secure conviction. The adoption of the *Printers' Ink* bill or its equivalent by Congress and by all of our state legislatures will mean a new era of business honesty. THE JOURNAL of the American Medical Association is, of course, primarily interested in securing honest methods and products in its own peculiar field, namely, that of medicinal preparations offered for sale either to the profession or to the public. Honesty in business, however, is not readiiy divisible into classes. The leaven of sincerity must permeate the entire mass. The most far-sighted and progressive business men have recognized that honesty and truthfulness are indispensable assets for the successful conduct of any business. The strongest force for the purification of advertising to-day is the growing determination on the part of advertising men themselves to put an end to the deception and fraud which have so long characterized some phases of this business.

1. Model Vital Statistics Bill, Medical News, THE JOURNAL A. M. A., July 18, 1914, p. 251.

## IODIN IN SPECIFICALLY INFLAMED TISSUES

The detection of iodin as a normal constituent of the animal body and its peculiar localization in the thyroid glands was the fortunate outcome of an accidental observation by Baumann in 1895. The credit for such "lucky strikes" in science is not to be minimized because they represent unexpected findings. Keen observers have contributed quite as much to the advancement of knowledge as have the more systematic routine investigators. A recent instance of a chance discovery is reported by Lewis and Krauss[1] from the Henry Phipps Institute of the University of Pennsylvania. In examining the relative distribution of iodin-yielding drugs in healthy and diseased tissues, respectively, they ascertained that tuberculous tissue derived from animals to which no iodin preparation had been knowingly administered may contain amounts of iodin very appreciably higher than the normal control of the same animal. For example, the tuberculous cornea of rabbits inoculated in one eye with tubercle bacilli was found to have as much as 2.67 mg. of iodin per gram of dry tissue, whereas the healthy cornea was iodin-free. This apparent deposition of an element of supposed physiologic potency in specifically inflamed tissue raises some novel questions in pathologic chemistry, among others the influence of various articles of diet and conditions of various organs, particularly of the thyroid, on the content of iodin in the tissues.

1. Lewis, P. A., and Krauss, R. B.: The Iodin Content of Tuberculous Tissue, Jour. Biol. Chem., 1914, xviii, 313.

# Medical News

### ARIZONA

**Personal.**—Dr. Frank W. Randall, Douglas, has tendered his resignation as city physician. He is serving as lieutenant colonel in the Mexican Constitutionalist Army, under Cabral.

### ARKANSAS

**Personal.**—Dr. William C. Tipton, Mountain Home, has been appointed by the State Board of Charities to be physician at the Confederate Soldiers' Home, Little Rock, to relieve Dr. Mason, who will go to Eagle Springs for his health.——Drs. Isaac N. McCollum, Joseph S. Westerfeld and Cecil H. Dickerson have been appointed members of the Conway Board of Health, the first two being respectively chairman and secretary.——The appointments of Drs. J. Hal Neal, Jr., Fort Smith, and John T. Perry, Greenwood, as health officers of their respective districts, have been confirmed by the state board.

### CALIFORNIA

**Personal.**—Dr. Alexander S. Kelly, Oakland, has been reelected president of the Board of Education.

**City Relief Home to be Enlarged.**—Superintendent O. M. Wallenberg of the City Relief Home, San Francisco, having complained of the congested condition of that institution, plans for enlarging it have been ordered prepared.

**Action to Protect Water.**—The San Diego city council has been notified by the members of the county medical society that filtration of the city water is necessary to protect the city against communicable diseases. Samples of water from various localities have shown dangerous conditions.——The San Francisco Board of Health is considering a protest made against the contamination of the watershed in Pleasanton Valley by a real estate company, which plans to sell the watershed to the city, and the land to farmers.

**Escape of Lepers from Hospital.**—The escape of five lepers from the Los Angeles County Hospital is to be made the subject of grand jury investigation, according to the county health commissioner, Dr. Edmund O. Sawyer. One Japanese and four Mexican lepers escaped during April and June, owing, it is said, to the inability to maintain proper supervision. There are now four lepers in the hospital colony, but it is said to be utterly impossible to keep a satisfactory watch over them. The occurrences are considered additional reason for the establishment of a national leprosarium.

## ILLINOIS

**Personal.**—Dr. Claude B. Higby, Eureka, has sold his practice to Dr. Robert H. Smith of Seaton, and will leave soon for Los Angeles, with his family.——Drs. Robert C. Bourland, John E. Tuite and Dudley W. Day, Rockford, have been appointed medical examiners of the pension board.

**Health Inspection of Railroad Depots.**—The State Board of Health field inspectors are to begin a tour of inspection of railroad depots. They will consider especially sanitation of toilet-rooms, water-supply, cleanliness of waiting-rooms, cuspidors, sanitary conditions of restaurant kitchens and eating-places, ventilation and disposal of waste, and conditions of the stock-loading pens in the vicinity.

## INDIANA

**Model Tuberculosis Cottage Erected.**—A portable cottage for tuberculosis patients has been erected in Goshen by the Elkhart County Anti-Tuberculosis Society. A second one has been donated by the manual training school of Bristol and will be erected soon.

**Howard County to Issue Book on Care of Babies.**—Dr. Burton A. Thompson, county health officer, is about to issue a book on the care of infants—their food, clothing, baths and common diseases—for free distribution among mothers, with the purpose of cutting down the death-rate among children.

**Training School for Nurse-Maids.**—Dr. Eugene B. Mumford, who has recently returned from postgraduate work in the East, and director of the milk clinic of the Children's Aid Association, Indianapolis, has started a training school for nurse-maids. They expect to train girls of good character to keep babies well, but not to take care of sick children.

**Violation of Medical Practice Law Charged.**—Affidavits against Mrs. Ada Converse and Miss Edith Cloyd, Christian Science practitioners, charging them with violating the state law for practicing medicine without a license, have been filed at Richmond, Ind. The reason of this was the death of Dorothy Murray, a 5-year-old girl, who died of diphtheria and had been treated by them.

**Personal.**—Dr. Harry S. Mackey, Indianapolis, has been appointed physician for the new inebriate ward at the Marion County workhouse, which has been opened at a cost of $1,800.——Drs. William F. Clevenger, Thomas Hood and J. Rilus Eastman, Indianapolis, have sailed for Europe to spend the summer.——Dr. Charles H. Loomis, Laporte, who has been ill in Christ Hospital, Cincinnati, for several weeks, has returned to his practice.——Dr. Darmen A. Rhinehart of the department of anatomy of the University Medical School, Bloomington, has resigned his position to accept that of head of the department of anatomy in the Medical School of the University of Arkansas, Little Rock.

## IOWA

**Tuberculosis Hospital Opened.**—The Scott County Tuberculosis Hospital, which cost $75,000, was opened July 4. It is intended to give fresh-air treatment.

**Health Officers Given More Power.**—The State Board of Health, July 9, adopted a new rule giving health officers absolute power in handling cases of quarantine for contagious diseases.

**New Officers.**—Austin Flint Cedar Valley Medical Society, at Cedar Falls, July 14-16: president, Dr. George Kessel, Cresco; vice-president, Dr. Thomas U. McManus, Waterloo; secretary, Dr. Charles F. Starr, Mason City (reelected), and treasurer, Dr. Will L. Hearst, Cedar Falls. The next meeting of the society will be held in Waverly, November 10.

**Changes in Fee-Bills.**—The Clarke County Medical Society, July 2, made the following changes in fees, which became effective July 15: day calls in town, $2; day visits in country, $2 with mileage as follows: first mile $1 and each additional mile 50 cents; night visits (9 p. m. to 6 a. m.) 50 per cent. additional; confinement cases (normal), $15 in town, with mileage as shown in country: consultations in town, $10, with mileage as above in country; life-insurance examinations; $5, anesthetics in town $10, with mileage as above in country.

**Personal.**—Dr. James R. Guthrie, Dubuque, dean of the College of Medicine of Iowa University, and member of the faculty during twenty-five years, has resigned from the Iowa Board of Education, and has been made dean emeritus of the College of Medicine. Dr. Lew Wallace Dean, Iowa City, has been elected to succeed Dr. Guthrie.——Dr. Henry F. Steinle, Burlington, is in Europe.——Dr. Roscoe P. Carney, Davenport, has been selected as temporary head of the Scott County Public Hospital.——Dr. Edward E. Dorr, Des Moines, has resigned from the executive committee of the Associated Charities.

## KANSAS

**Personal.**—Dr. Wilson R. Priest, Concordia, has been appointed consulting surgeon to St. John's Hospital, Salina.

**Sanitary Survey of County Schools.**—Dr. Jacob L. Everhardy, Leavenworth, health officer of Leavenworth County, has been personally inspecting all school houses in the county, and has addressed circular letters to the clerks of the schools instructing them as to the keeping of the schools in a sanitary condition.

## MARYLAND

**New Health Offices Open in September.**—The new city health offices to be occupied by the Health Department, in charge of Health Commissioner Nathan R. Gorter, will be ready for occupancy by September 1. All the subdepartments except those of bacteriology and chemistry are now located in the new building. The general public will be offered an early opportunity to view the facilities for work of the department.

**Health Survey for Dorchester County.**—Surgeon Leslie L. Lumsden, Public Health Service, and Dr. John S. Fulton, secretary of the State Board of Health, are to make a thorough inspection of health conditions in Dorchester County. It is expected ultimately to cover the entire state in this manner. Recommendations will be made as to general improvements in sanitation. Dr. William H. Welsh, president of the state board, in now in Europe. On his return the board will take up the matter of appointments for six additional health officers. At the last session of the legislature, the state was divided into ten sections, and provisions made for a health officer for each district. So far but four officers have been appointed.

## MASSACHUSETTS

**New Heads for Boston Dispensary.**—Drs. Henry M. Chase and Hilbert F. Day have been appointed surgeons in charge of the Boston Dispensary, by the board of managers of that institution, to fill the vacancies left by the retirement of Drs. Benjamin Tenney and John Homans, who will continue as consulting surgeons.

**Floating Hospital Celebrates Bennet H. Nash Day.**—One hundred and four beneficiaries were taken on the floating hospital recently, in honor of Bennet H. Nash day, named by Mrs. Nash in memory of her husband, who was the friend of that philanthropy. Several other days have been named for the gifts of various philanthropic citizens. By this method the work of the floating hospital has been considerably extended. There are sixty-nine nurses on the staff of the hospital this season, more than ever before.

**Dr. A. G. Rice to Preside at Open Air School Association Session.**—Preparations are being made for the Philadelphia

meeting of the American Open Air School Association, of which Dr. Allen G. Rice of Springfield, Mass., is president and chairman of the board of directors. The session will be held in conjunction with that of the Fourth International Congress on Home Education and the efforts of the committee on program just now are directed in securing papers from teachers, investigators, physicians and others dealing directly with results secured through fresh-air class rooms.

**Association for Prevention of Infant Mortality to Meet in Boston.**—The first program of the National Conference of the American Association for the Study and Prevention of Infant Mortality, to be held in Boston during November, 1914, has just been announced. All of the general meetings are to be open to the public; the first will be held at the Harvard Medical School, Thursday afternoon, November 12. This meeting will be a joint session with the Massachusetts State Conference of Charities, which has moved the date of its convention forward in order to cooperate with the first named association.

## MISSISSIPPI

**Toxins and Vaccines to be Supplied at Cost by State Board.**—The State Board of Health has voted to distribute to the public at cost vaccines and toxins, including diphtheria and typhoid toxins and vaccines.

**Personal.**—Dr. Charles A. Sheely, Gulfport, has resigned as a member of the school board.——Dr. Noel C. Womack, Jackson, has been appointed a member of the State Board of Health to succeed Dr. Giles S. Bryan of Amory, who has resigned.——Dr. Joseph M. Ware has been appointed to perform the duties of city physician during the absence of Dr. James P. Wall, who left for Europe, July 7.

**Campaign for Free Tuberculosis Dispensaries.**—The Mississippi Anti-Tuberculosis Campaign committee, in cooperation with the Federation of Woman's Clubs, is carrying on a crusade for the establishment of local free dispensaries and visiting nurses for each town in Mississippi. Large signs, moving-picture slides, literature and lectures are to be provided, and the expenses of the campaign are to be paid for out of the proceeds of the sale of Red Cross Christmas stamps in the state.

## MONTANA

**Montana State Medical Association Holds Thirty-Sixth Session.**—The thirty-sixth session of the Montana State Medical Association convened in Lewistown, July 8, 1914. President W. P. Mills presided and in his opening address reviewed recent progress in medicine and surgery. The scientific discussion which was of unusual interest included papers on every phase of medical study. Special addresses were delivered by Dr. Justus Matthews, Rochester, Minn.; Dr. J. F. Golden, Chicago, Ill., and Dr. C. E. Sears, Portland, Ore. During the session entertainments were numerous, including a 70-mile auto ride over the beautiful Judith Basin and a banquet. The following officers were elected: president, Dr. J. H. Irwin, Great Falls; vice-presidents, Dr. J. C. Schapps, Butte; Dr. C. F. Jump, Bozeman, and Dr. P. L. Greene, Livingston; secretary-treasurer, Dr. E. G. Balsam, Billings. Bozeman was chosen as the next place of meeting.

## NEBRASKA

**Personal.**—Dr. J. S. Butler, Superior, has filed an announcement of his candidacy for state senator.——Dr. George Tilden, Omaha, for over forty years alienist of the county board of insanity, has resigned owing to ill health following the death of his wife. He has notified the directors of the Old People's Home that he will endow it with a fund of $5,000, in accordance with the wishes of his wife.——Dr. Samuel K. Spalding has been appointed to fill Dr. Tilden's place on the board of insanity.

## NEW JERSEY

**Hospital Officials Elected.**—The Camden County Tuberculosis Commission elected Dr. Lee J. Hammett, Glen Gardner, as superintendent of the county tuberculosis hospital.

**Paterson Building New Hospital.**—Ground was broken July 20, in Paterson, for the new institution to be known as the Nathan and Miriam Barnert Hospital. The plot consists of sixteen city lots in the finest section of the city, and is the gift of former Mayor Barnert, who will finance it completely. Brief exercises were held in connection with the inauguration of the first work on the institution. The complete outlay approximates $250,000.

**Tuberculosis Sanatorium Nearing Completion.**—The new tuberculosis sanatorium of Camden County at Ancona is now being fully equipped with sun porches and approaches, and it seems that no more beautiful or healthful spot could have been chosen than the eleven acres of land which are now being used. The furnishing and equipment of the various buildings are being purchased, and it is expected that the building will be occupied in a short time.

## NEW YORK

**Reciprocity between New York and Virginia.**—Virginia and New York have drawn up a reciprocity agreement for the mutual endorsement of each other's medical licenses, providing the applicants have complied with all the specified requirements.

### New York City

**Personal.**—Dr. and Mrs. John Hammond Bradshaw, Drs. James B. Conant, Joseph Sheehan and G. Randolph Manning have sailed for Europe.

**St. John's Guild Asks Aid.**—The Seaside Home and the Floating Hospital of St. John's Guild, which last summer cared for 57,887 babies, children and mothers, is sending out a strong appeal for financial assistance in carrying on its work.

**To Study Ptomaine Poisoning.**—The Department of Health announces that as it is very difficult to learn how prevalent ptomaine poisoning is in this city since the only opportunity the city has to study the subject is when there are a considerable number of cases and the newspapers call attention to them. The department will welcome reports of suspected cases of bacterial food poisoning from private physicians, and if requested will gladly undertake special investigations, both epidemiologic and bacteriologic.

**Free Health Topics Movies.**—The Department of Health has begun its moving picture exhibitions in the parks and on the recreation piers of the city. In all twenty shows will be given, ten in Manhattan, two in the Bronx, six in Brooklyn, and one each in Long Island City and Flushing. In Manhattan and the Bronx the department will be assisted by the Tuberculosis Committee of the Charity Organization Society; in Brooklyn and Queens by the Tuberculosis Committee of the Brooklyn Bureau of Charities. On the occasions of the exhibitions many pamphlets on the prevention of tuberculosis are circulated.

**Bureau of Child Hygiene Asks Increased Appropriation.**—The plans of the Bureau of Child Hygiene of the Department of Health for the year 1915 are now being formulated and the bureau will request a budget allowance of $554,670, or $123,780 more than this year. The increase asked for is to provide for nine additional medical inspectors, three surgeons, nine dentists and eighty-four nurses. The Bureau of Welfare of School Children of the New York Association for Improving the Condition of the Poor is supporting the Department of Health in this request.

**Planning a Bureau of Public Health Education.**—The Board of Health is to include a Bureau of Public Health Education as soon as a director for the bureau has been selected through examination by the civil service commission. The director, in order to qualify, must have a degree from a medical school, must have been engaged in public health work and should have some experience in editorial work. The position will pay $5,000 a year. It is said that New York is the first municipality in the world to employ a director of public health education.

**To Investigate the Patent Medicine Business.**—Dr. Sigismund S. Goldwater, commissioner of health, has announced that he has discovered an old section of the sanitary code which forbids the sale of fraudulent proprietary articles and that a systematic investigation of the patent medicine business would be begun at once. It is proposed to insist that the manufacturer of a patent medicine name the ingredients in the mixture and it is believed that public opinion is sufficiently enlightened to support this movement and to drive useless nostrums out of the market when their ingredients become known.

**Insurance Company Opens Sanitarium.**—The Metropolitan Life Insurance Company dedicated its new sanatorium at Mt. McGregor, 9 miles from Saratoga, on June 20. The plant consists of a group of cement buildings, including several open-air wards, an infirmary and several other buildings necessary to the administration of the institution. The sana-

torium was built under the direction of Dr. S. Adolphus Knopf and Dr. John H. Huddleston, and cost $1,000,000. Among the speakers at the dedication services were Dr. Abraham Jacobi, Senator Brackett of Saratoga, Dr. Haven Emerson and L. P. Cox, president and manager of the Association of Life Insurance Presidents. The fact that 20 per cent. of all the mortality on the company's books was due to tuberculosis led the officers to establish this institution, which it is hoped will act as a lesson to policy holders, the employees of the company and to the public, and it is believed that merely as a business stroke it will prove one of the most valuable assets of the company.

**Increase in Rabies Arouses Health Department.**—During the first five months of 1914 there has been a decided increase in the number of cases of rabies in this city. In this time there have been 40 cases of rabies in the Bronx against 45 for the entire year 1913; in Manhattan there were 73 cases against 110 for 1913; in Queens there were 28 cases against 35 for the entire year of 1913; Brooklyn is the only borough not showing an increase and here there have been 19 cases reported for the first five months of 1914 against 73 for 1913. Thus far this increase has not caused a corresponding increase in the number of cases among human beings, but Dr. Sigismund S. Goldwater is working for an amendment to the present city ordinance which provides that dogs must be either muzzled or kept in leash during June, July, August and September. The objection to this part of the ordinance is that it limits the control of dogs to the hot months. The ordinance further states that dogs found at large may be taken up by the police or poundmaster and taken to the city pound, but this part of the ordinance is a dead letter because the city has no pound and no poundmaster. The new ordinance will provide for the establishment of a pound. Last year 60,000 dogs and 200,000 cats were taken up by the Society for the Prevention of Cruelty to Animals and it is stated that this is ten times the number taken up and disposed of in any previous year.

## NORTH DAKOTA

**Dedication of Tuberculosis Cottage.**—A fully equipped cottage for the use of tuberculosis patients was dedicated at the State Sanatorium, Fargo, June 13, by the Arch Masons and Grand Chapter of the Order of the Eastern Star.

## OHIO

**Personal.**—Dr. Ernest Crockett, Ashtabula, has been appointed coroner of Ashtabula County to succeed Dr. R. J. Baxter, Conneaut, resigned.

**Leper to be Deported.**—Salvatore Paluso, the leper at the Cleveland City Hospital, was deported to Italy by the United States government, July 20.

**Health Board Resigns.**—At the monthly meeting of the Adelphi Board of Health, July 16, four members of the board presented their resignations, to become effective August 1. The other member resigned some time ago. The resignations are said to be caused by no grievance, but were presented merely for personal reasons.

**State Sanitation Statutes Supersede Those of Municipalities.**—According to the ruling of Attorney-General Hogan, while Ohio cities with home-rule charters are exempt from some state laws, they are subject to all health laws involving police power, and are without authority to make and enforce regulations inconsistent with them. Orders of the state board are held to supersede those of city boards in all matters pertaining to the quarantine of individuals and public conveyances and against other cities. The attorney-general holds that if the city were threatened with an epidemic, the state board and not the city board has the right to impose quarantine on vessels, railroads, street-cars and private conveyances. Such quarantine ordered by the city board is ineffective unless approved by the state board.

## OREGON

**Personal.**—Dr. Julius F. Neuberger, Portland, has been appointed assistant surgeon in the navy and assigned to duty on the *Colorado* to relieve Assistant Surgeon Percy F. McMurdo, also of Portland, who now returns to civil life.

## PENNSYLVANIA

**Reading Visiting Nurse Report.**—At the July meeting of the Visiting Nurse Association of Reading, the report of the supervisor for the year showed that 803 visits had been made; 97 new patients enrolled; 8 discharged as cured; 52 as improved, and 13 sent to hospitals. The total number of deaths reached 7.

**New Quarantine Hospital.**—A new hospital for the care of immigrants suffering from the less serious contagious diseases is to be erected at the State Quarantine Station at Marcus Hook. The old building, where small-pox and cholera patients are now confined, will continue for that use and the new building will accommodate about 100 beds.

### Philadelphia

**Hospital News.**—A contract has been awarded for the erection of a ward dispensary for the Germantown Hospital. The addition will be one story high, of structural steel and will cost about $30,000.

**Baby-Saving Stations.**—To aid in the summer campaign of baby-saving settlements, hospitals and private charities have established baby clinics and bureaus of information for mothers, all under the control of the Babies Welfare Association, the central bureau being in City Hall.

**Personal.**—Dr. John H. Girvin sailed for Europe July 21. ——Dr. George de Schweinitz has resigned as ophthalmic surgeon at the Philadelphia General Hospital.——Dr. Edward A. Shumway has been appointed by Dr. Richard Harte, the director of public health and charities, as honorary ophthalmic surgeon to the Philadelphia General Hospital.

**Sale of Beer Decreasing.**—According to the report of the Internal Revenue Department for the First District for the year ending June 30, Collector Lederer was in receipt of taxes amounting to $3,249,358.75 as compared with $3,318,061.50 in 1913, making a decrease of $68,702.75. The tax on spirits, however, showed an increase of $276,049.37, due principally to the use of alcohol in industry and arts. The tax on cigars and cigarettes for 1913 was $2,699,091.57 and for 1914, $2,763,884.58; that on tobacco for 1913 was $1,403,665.20, for 1914, $1,679,714.57.

## UTAH

**State-Wide Clean-Up Contest.**—The Utah Development League is conducting a clean-up contest among the various cities of the state. The scoring is to begin the week of August 17 and will be on fourteen different points. The league sends public speakers to local committees to arouse interest, when desired.

**Building Out-Door Tuberculosis Ward.**—An open-air tuberculosis ward has been conducted during the summer on the roof of the Salt Lake County Hospital. A tent colony was established with fourteen patients. The experiment has proved so successful that the county commissioners have voted to erect a large wooden building on the plan of a portable summer house, to replace the tents, the upper portions being open and screened but equipped with windows to be raised or lowered as desired. The building is to be constructed as soon as possible.

## VIRGINIA

**State Board of Health Appointments.**—Governor Stuart has appointed the following members of the State Board of Health: first district, Dr. Samuel W. Hobson, Newport News; second district, Dr. Otho C. Wright, Jarratt; eighth district, Dr. William M. Smith, Alexandria.

## WASHINGTON

**Personal.**—Dr. Deshler F. Sells, Spokane, has been reappointed county physician.——Dr. Frank C. Robinson has been appointed temporary physician of the Walla Walla prison, vice Dr. Lawrence R. Quilliam, resigned.

**Prohibition of Street Sale of Ice-Cream and Soft Drinks.**—After investigating the conditions under which ice-cream and soft drinks are sold by street venders, Dr. John S. McBride, health commissioner of Seattle, has prohibited all such sales, except those of soft drinks in bottles.

## WEST VIRGINIA

**Honor Veteran Physician.**—Over a hundred persons of Moundsville and surrounding towns united recently in giving a banquet in honor of Dr. George W. Bruce, on the occasion of his eighty-seventh birthday. Dr. Bruce has been practicing in West Virginia for sixty-five years.

## WISCONSIN

**Public Comfort Stations to be Established.**—As a result of a survey of Milwaukee, made by Health Commissioner Ruhland to determine the need of the establishment of public comfort stations, Dr. Ruhland has recommended the establishment of fifteen stations at various points throughout the city.

**Medical Inspection in Fond du Lac.**—Final measures are being taken to provide for the medical inspection of the public schools of Fond du Lac. Information is now being secured concerning methods used in other cities, and the local medical society will take steps to provide physicians for this important work.

**Milk Ordinances Won by Milwaukee Health Department.**—The last opposition to the efforts of Health Commissioner George C. Ruhland to enforce the ordinance for the tuberculin test of milk in Milwaukee was overcome at the last meeting of the common council judiciary committee, and an ordinance was submitted by Alderman W. C. Wehe which provides not only for the tuberculin testing of all cattle producing milk for use in Milwaukee, but also requires pasteurization. The ordinance has been referred to the city attorney by a vote of three to two. This action kills the ordinance introduced to provide for the pasteurization as an alternative for the tuberculin testing, and gives the Health Department a free hand for the enforcing of the tuberculin ordinance.

**Conference of Health Officers.**—Over seven hundred health officers of the cities, towns and villages of Wisconsin convened recently in the capitol to consider questions of disease prevention. Dr. Cornelius A. Harper of the State Board of Health presided. One of the subjects which received considerable attention was that of the milk-supply and its relation to tuberculosis, the assembly being almost unanimously of the opinion that this disease might be contracted by the use of contaminated milk. The subject of trachoma was treated by Surgeon Taliaferro Clark, Washington, D. C., of the Public Health Service. The whole-time health officers were generally approved especially in their work in the towns of Milwaukee and La Crosse. Rural sanitation and the relation of health officers to infant mortality had conspicuous places in the valuable discussion.

## GENERAL

**Trachoma in the Carolinas.**—The Public Health Service following up its work in Kentucky, West Virginia and Virginia, has made a trachoma survey in the mountain sections of North and South Carolina. In the report of Surg. Albert D. Foster in *Public Health Reports* July 10, 1914, the results of this work are given. It was found that trachoma exists in North Carolina in three different localities, although the disease is not widespread. At Cherokee, N. C., measures had already been taken to determine the presence of the disease and to control its spread. Foreign immigration was not found to be a factor in the introduction of the disease. The negro race in the two Carolinas is practically free from the disease.

**The Plague Situation.**—Up to time of going to press of THE JOURNAL for July 25, there had been reported seven cases of plague in New Orleans. Since that date, six additional cases have been discovered. Case 8 is that of C. J. Seaman, white, a man 28 years old, who lived at 2845 Baronne Street, and worked in a clothing store at 629 Canal Street, between Exchange and Royal. He sickened July 16, with a left femoral bubo and was removed to the Isolation Hospital, July 20. Case 9 is that of Regina Schmitt, white, a German woman, aged 73. She is a grandmother to Helen Soell, Case 6. She sickened July 20 and was seen July 21. Death occurred July 23, and the diagnosis was confirmed at necropsy. Case 10 was William Ernst, a white man aged 50, who lived at 4528 Constance Street and worked in a saloon at Lafayette and Fulton Streets. Case 11 was that of Joseph Schmitt, a white male aged 41. He worked as janitor at 532 Camp Street, whence came also human cases 6 and 9. He sickened July 24. Case 12 was Joseph C. Williams, a colored male aged 24, residing at 1523 Arts Street, and working at 611 Commerce Street, between Lafayette and Girod Streets. He sickened July 23 with right femoral and inguinal buboes. Case 13 was Rosie Southern, a colored girl aged 16, residing at 1800 Bienville Street and who does housework at 1904 Bienville Street. She sickened July 22. There have been four deaths in the thirteen reported cases.

The following table shows the addresses from which rodent cases have been taken. Over 9,000 rats have been examined:

| Case No. | Address | Date |
|---|---|---|
| 1 | 1904 Magazine Street | July 16, 1914 |
| 2 | Burgundy Street | " 16, " |
| 3 | 1529 Religious Street | " 16, " |
| 4 | 525 So. Peters Avenue | " 17, " |
| 5 | 424 So. Rampart Street | " 17, " |
| 6 | Dumain St. Wharf | " 21, " |
| 7 | 819 Antonine Street | " 22, " |
| 8 | 511 St. Ann Street | " 24, " |
| 9 | 1531 Magazine Street | " 25, " |
| 10 | 117 North Liberty St. | " 26, " |
| 11 | 1171 Annunciation St. | " 26, " |
| 12 | 518 Barracks Street | " 26, " |
| 13 | Stuyvesant Docks | " 27, " |
| 14 | 1823 Second Street | " 27, " |

The fight against the plague is continuing, and practically every measure known for securing wide publicity in education has been taken. The various ordinances previously reported have passed the committee of the Board of Health, and there is every indication of their final passage. Display cards are being used in the street-cars, and in moving-picture shows. Garbage collection service has been improved and permanent incinerators have been ordered.

Addresses have been made this week before the following bodies: Hotel and Restaurant Men's Association; Y. W. C. A.; White Long Shoremen's Union; Master Bakers; Transportation interests; LaSalle School; Brewery Workers; New Orleans Funeral Directors' Association, Street Car Employees, New Orleans policemen, and various other bodies.

Outgoing maritime quarantine stations have been established at West End and Spanish Fort for the purpose of fumigating vessels from Old and New Basins.

Inspection of overland outgoing freight has been very greatly increased and covers about two thousand cars per week. All cars are first inspected to determine whether or not they are rat-free and rat-proof, all freight is inspected and that which is packed in such a manner as to harbor rats is repacked. Freight is loaded under the direction of an inspector, the car is sealed with a lead seal bearing the government mark and the car is labelled to show that it has been inspected and passed.

The following is a copy of an order issued by the superintendent of schools:

TO JANITORS:

All trash accumulated in or under school buildings, in yards or janitors' lodges must be collected and burned.

Piles of lumber or old desks must be raised two feet from floor or ground. Metal garbage cans must be in good condition and kept tightly covered at all times.

Rat traps to be baited with a small piece of bacon, the bacon to be tied on. Place traps near rat holes, and in places where rats come and go in their nightly excursions for food. Traps must be visited morning and evening.

When rats are caught, pour kerosene over the rat to kill the fleas. Wrap body of rat in paper with tag attached thereto giving date on which rat is caught, name and location of school, and bring to Headquarters, Marine Hospital Service, 163 University Place.

The above instructions are given by authority of the Board of Directors of New Orleans Public Schools.

Edmund Moss, M.D., Medical Director.

The school authorities have 1,000 traps set in various parts of the city.

The overland freight inspection service has been placed in charge of Acting Assistant Surgeon Oscar Salomon of the Public Health Service. Acting Surgeon Fred Turney has been added to the oversea outgoing quarantine service. Passed Assistant Surgeon Hugh DeValin has reported for duty and has been assigned to Sanitary District No. 4, bounded by Canal, Claiborne, Elysian Fields and the River. Acting Assistant Surgeon H. McG. Stewart has reported for duty and has been assigned to the inspection of outgoing waterborne freight. United States quarantine steamer *Neptune* arrived in New Orleans July 27, in command of Passed Assistant Surgeon Norman Roberts, and was assigned to disinfection of outgoing vessels by the carbon-monoxid method. More than 320 men are now on the pay-roll of the Public Health Service and engaged in New Orleans.

On July 24, the city of Shreveport, La., placed a restricted quarantine on freight and passengers from New Orleans.

Posters have been prepared of which the following is a copy:

Fasten this up in your kitchen. To make New Orleans the city sanitary get rid of rats by taking away their food supply. Kitchen rules: Keep all supplies in rat proof bins. Keep meats in safes or in refrigera-

tors. Keep uncooked vegetables in crates or shelves. If cooking is done with wood or coal fire, burn all garbage as fast as it is created. Put only small amounts into the fire at one time. If cooking is done with a gas fire, keep all garbage in water tight, metal garbage cans or buy a gas incinerator. Keep the cover on the garbage can. Clean your premises now and keep your premises clean. United States Public Health Service, W. C. Rucker, Asst. Surgeon General, Commanding.

## CANADA

**Personal.**—Dr. Herbert A. Bruce is returning to Toronto from a trip to England.——Dr. John L. Chabot, M. P., Ottawa, has sailed for Europe. Dr. Chabot is likely to be appointed a member of the Canadian Senate.——Dr. Edith Brown, the founder and principal of the Women's Christian Medical College, Ludhiana, India, is on a visit to Toronto, the guest of Dr. Margaret Patterson.

**University News.**—Dr. Donald A. Campbell, Halifax, N. S., sometime professor of medicine in the medical department of Dalhousie University, has intimated to the governors of that institution that he will provide $60,000 to endow a chair of anatomy in memory of his son, the late Dr. George Campbell, who some ten years ago fell a victim to pneumonia while away on his wedding tour.——Again the governors of the University of Toronto have approached the provincial treasurer, stating that their requirements in the near future will be $1,500,000. The increasing deficit in the maintenance account, which is now nearly $130,000, including the estimates for 1914-15, was fully discussed with the treasurer. An urgent request was also preferred for an immediate grant of $200,000 for new gymnasium and athletic equipment.——More new regulations will become effective this coming session at McGill University, Montreal. The age limit of 17 years for entrance to any department has been reduced to 16 years. A student will only be allowed to miss three-quarters of a session's lectures instead of seven-eighths as formerly, except under a physician's certificate for illness.

**Fee-Splitting and the Ontario Medical Association.**—One year ago the Ontario Medical Association appointed a special committee on this subject, consisting of Drs. Harry B. Anderson, Frederick N. G. Starr and the general secretary, Dr. F. Arnold Clarkson, all of Toronto, to inquire into the whole subject as it affected the medical profession of Ontario, and to report at the meeting just held in Toronto. They brought in a report the substance of which is as follows: that such practices are unfair to the large majority of the profession; that they are inimical to the recipients as they mostly mean the receiving of payment in an underhand way; that they are not in the best interests of the patient, whose welfare should be of first importance; that there should be an educational compaign to teach the public that the physician who makes the diagnosis should be adequately paid for his services; that the surgeon should make no visits except those consistent with the case after the operation and that the physician's duties should not be minimized nor the operation over-estimated; that in fixing his fees the surgeon should consider the ability of the patient subsequently to pay the physician; that a standing committee of the association should be in existence to consider matters of this character from time to time with a view to safeguarding both the interest of the public and the profession.

## LONDON LETTER

London, July 17, 1914.

### A Leper Home

In his will the late Lord Strathcona has left $25,000 to Mr. John Burns, president of the Board of Trade, for the provision of a home and the maintenance of fifty lepers. The number of lepers in England is estimated at about twenty. The money is now invested in trust administered by private persons who conduct a home or refuge where the identity of the lepers is kept strictly private in order to avoid criticism. Its existence accordingly is known to very few persons. There appears to be no danger whatever of contagion.

### Sir William Osler on the Control of Tuberculosis

In an address at the annual conference of the National Association for the Prevention of Consumption, Osler said that the tuberculous might be divided into three classes: (1) persons who have somewhere a small area of tuberculosis (90 per cent. of all persons); (2) those in whom the disease is active enough to produce symptoms, but in whom there is the possibility of arrest or cure, with restoration to working health, and (3) those who are doomed; in whom the disease progresses week by week, month by month, and year by year, and in whom from one year up to five sees the end. When the workers had a living wage, when the house became a home, when the nation spent in food what it now spent in drink, then there would be millions practically immune, continued Osler. There were three essentials in the cure—education, control and rigid regimen. As there was room for only one-third of the present cases in sanatoriums, much must be done in the homes. The splendid efforts of officers of public health had in fifty years cut in half the mortality from tuberculosis. They had tracked the enemy and knew his every stronghold and they knew his three allies, poverty, bad housing and drink. But the disease remained the most powerful among man's innumerable enemies. Before them was a long, slow hundred years' war, or even longer, in which coordination, cooperation and enterprise would win just as surely as it had done against typhus and typhoid.

### Sir Clifford Allbutt on the Medicine of the Future.

In distributing prizes at St. Thomas' Hospital, Sir Clifford Allbutt said that he was glad to see that the young men were still like a pack of hounds following a breast-high scent in full dash after the subtle quarry of truth. It was a great joy to all those of the older generation to feel that the splendid results of the last half century would be carried forward even more brilliantly by the great men of the rising generations. The advance was largely due to that analytic reason known as science. It would not, however, be all for the best if the men of science had had it all their own way. Practical men said that there was something very much more in practice than scientific and analytic knowledge. Why was it that the practical man had so much contempt for the young men who came from the training-schools? The fact was that in the art of medicine there was something much more than science could give. The training of the hand and eye gave a certain facility and power that could not be obtained by any amount of school training. The young man was apt to look on the older practitioners as duffers, but the young and the old were necessary to each other. Even in the laboratory the skilled technical hand knew that he could do more by his own instinct than one who had only a theoretic training. The practical men were, however, under the disadvantage that they had no grip of principle. Their mind was not flexible; it was all right for the work of to-day, but not for the work of to-morrow. Small revolutions in practice meant the scrapping of old methods.

#### SPECIALIZATION IN MEDICINE

There was now no lack of men who were going out into general practice into the towns and villages. That would lift up the whole scheme of general practice. Much more than this, however, was wanted, especially in the specialties of medicine. The only possible outcome of the present tendency could be that foreshadowed in the recent budget, which contained a scheme for establishing in such available centers as the country town special departments where the panel (insurance) practitioner should have it in his power to command any specialist services that he needed. That would lift English medicine to a level that it had never yet attained. The time of medicine was coming. With the scientific centers to exhilarate the practitioners, medicine would be seen reaching the social value and social consideration it so thoroughly deserved. A great career was thus opened to a man, both in general practice and in medical science. Cambridge had been the first place in this country to establish a research hospital. The Committee of National Research was setting up another, while St. Thomas' Hospital was bringing into existence what would be the second research hospital in the country. In conclusion Sir Clifford Allbutt spoke of the need of establishing a ministry of health, an office for which he had insisted ever since he had spoken in public and which the Chancellor of the Exchequer had the other day said was necessary. There was a need, too, for a study of comparative medicine. Medicine was to-day in the position occupied by astronomy in the days before Copernicus. Everything was centered in man-medicine, whereas, if great progress was to be made, the medicine of the gooseberry-bush should be studied.

### Investigation of Mumps

A report by Dr. M. H. Gordon of the Local Government Board on an experimental investigation in relation to mumps or epidemic parotitis has been issued. During the twenty years, 1891-1910, the annual mortality from mumps in England and Wales varied from a minimum of 54 in 1895 to a

maximum of 118 in 1907; and during the last ten of these years the death-rate was constant at about 3 per million living. The recorded deaths from mumps were practically equal for the two sexes. The disease was most fatal in children under 5, especially in infants under 1 year of age, and least fatal between the ages of 15 and 25. On comparing the number of deaths from mumps before and after 5, in the two sexes, respectively, a remarkable difference is seen. Whereas 50 per cent. of the total male deaths took place in children under 5, only about 37 per cent. of the female deaths occurred within the first lustrum, equalization being effected by a relatively higher mortality among females between 55 and 75 years of age. Ten monkeys were inoculated with filtrates taken from ten cases of mumps; four died, one developed an illness from which it recovered, and five appeared to be unaffected. To obtain the material for these experiments, patients with mumps in the acute stage gargled thoroughly about 100 c.c. of a sterile 0.9 per cent. salt solution. The mixture of saliva and saline was passed through a Berkefeld filter, and this filtrate was injected into the monkeys. The experiments seem to justify the view that in a proportion of cases of mumps a virus occurs in the saliva that passes through a Berkefeld filter, and is capable of producing in the monkey by intracerebral injection a lymphocytic meningitis together with hyperemia of the central nervous system and acute degenerative changes in a proportion of the neurons. Furthermore, if the animal lives long enough, acute interstitial parotitis may be produced. It would thus appear that mumps is due to an ultramicroscopic virus comparable to that of poliomyelitis, small-pox, typhus and a number of other acute specific fevers.

## PARIS LETTER

PARIS, July 10, 1914.

### The Sixth French Conference on Public Assistance

The sixth national conference on public and private assistance has just taken place at Montpellier, under the presidency of M. Emile Loubet, former president of the French republic. The question of most importance was that of the assistance of physically abnormal infants. The meeting voted that the government should enact the most rigorous measures against alcoholism, that prolific producer of psychically abnormal, feeble-minded and delinquent children; that it should complete and perfect the existing laws regarding those psychically abnormal, especially the laws of June 28, 1903, on intractable and vicious wards of the Assistance publique; that of April 15, 1909, on the creation of classes of correction, to be affiliated with the elementary public schools, and autonomous schools of correction for feeble-minded children; and that of July 22, 1912, on courts for children and adolescents, giving the courts the obligatory character which they lack, particularly from the point of view of the creation of necessary establishments and medical examinations of young delinquents, and reuniting them all under a juvenile code, to facilitate their combined action.

As regards the physically abnormal children, the congress asked that the administration encourage the work which the Association orthopédique scolaire française is pursuing: the special annual examination, with a view to hunting out physical deformities. Special classes for teaching children with physical infirmities should be established, nor should such children be allowed to attend schools.

On the motion of M. Chausse, professor at the Faculté de droit de Montpellier, the meeting asked that the law should place a heavy fine on condidates for charity who misstate their resources by false declarations, and that the sentences in these cases be given an effectual publicity.

### Personal

At its meeting, July 7, the Académie de médecine elected an honorary member, Dr. Menetrier, in the section of pathologic anatomy, to replace Dr. Empis, deceased. Pierre-Eugéne Menetrier was born in 1859 and received his doctorate in 1887. He was successively head of the chemical department of the medical clinic of the Pitié, of the anatomic department of the same clinic, and of clinical medicine; he was named *agrégé* at the Faculté de médecine de Paris in 1892, and physician to the hospitals of Paris in 1894. His best work was given to research in pathologic anatomy, and, more specifically, to the study of tumors. He framed the chapter on "Tumors" for Bouchard's *Traité de pathologie générale*, and his book on cancer made part of the *Traité de médecine*, edited by Gilbert and Thoinot. In collaboration with Pierre Delbet and Dr. Herrenschmidt, he presented a classification and an international nomenclature of cancerous tumors at the Second International Conference for the Study of Cancer (THE JOURNAL, Oct. 29, 1910, p. 1568, and Feb. 11, 1911, p. 437).

Dr. Pinard, professor of clinical obstetrics at the Faculté de médecine de Paris, has retired.

The recently incorporated cabinet includes two physicians among its members: Dr. Augagneur, deputy, former professor of the clinics of cutaneous and syphilitic diseases at the Faculte de médecine de Lyon, former governor of Madagascar, was elected minister of public instruction and the fine arts; and Dr. Cauthier, senator, is in the department of marines.

### Death of Dr. Duguet

Dr. Jean-Baptiste Duguet, *agrégé libre* at the Faculté de médecine de Paris, has just died, aged 77. He was a clinician of the old school, who, while accepting the progress brought by the introduction of laboratories, always preferred the clinical examination from the diagnostic point of view. Beside his work on pultaceous and ulcerous anginas and on the treatment of certain forms of goiter by the interstitial injection of tincture of iodin, we are indebted to him for his demonstration of the parasitic nature of "blue spots," formerly considered characteristic of typhoid fever.

### The French Anti-Opium League

From the cosmopolitan ports of the Mediterranean, opium has reached France, and opium-dens abound to-day as much in our military stations, where they are the gravest peril that the young marines must face, as in the large centers. The danger seems grave enough to make the consideration of means of fighting it imperative, and a league has been formed for this purpose, with Dr. Charles Richet, professor at the Faculté de médecine de Paris, and M. Le Myre de Vilers, former governor-general of Cochin China, as honorary presidents. The league will endeavor with all its strength to obtain the discontinuance of the opium traffic. It asks, moreover, for most effective injunctions against drug-dealers of all sorts who swarm in the metropolis, and states that light fines do not hinder them from repeating the offense. The league purposes by conferences and tracts to put public sentiment on guard against the danger of the use of stupefacients, such as opium, cocain, hashish, etc.

## BERLIN LETTER

BERLIN, July 11, 1914.

### Proposed Board of Public Health for Berlin

Since it has been shown, as was to be expected, that the health officer, the Stadtmedizinalrat, who was appointed about a year ago, found the duties which the city of Berlin demands of its chief medical officer too exacting, the city government is contemplating the appointment of a number of assistants so as to form a board of health. Such an office, which corresponds somewhat to the local boards of health in large cities in the United States, is not known in Germany at present except in Hamburg. There to be sure it has not merely a municipal character since Hamburg is one of the German federal states. The board of health, therefore, constitutes in Hamburg the highest national authority on matters affecting the health of the public at large. The foundation which the city government has worked out for this department shows what a large field is included in the public hygiene of the city of Berlin, namely, water-supply and drainage, school hygiene and the medical care of the poor, the hygienic care of orphans, the insane, the control of epidemics and much else. The hospitals are included in another department. There is little doubt that if the Board of Health performs its functions successfully, the hospitals and other medical institutions, which so far have not been put under the health officer, will be included in this department, and so finally the centralization of the Berlin public health service, which has been demanded by physicians for many years, will be attained.

### Boarding Out the Insane in Families

The introduction of insane persons into families under medical supervision is a form of public care which has become quite general in Europe of late. In the Berlin Insane Asylum at Dalldorf it was introduced soon after the opening of the institution under the direction of Privy Councilor Sander. Dr. Paul Bernard, an attending physician at Dalldorf, recently discussed this method in the Society for Social

Medicine, Hygiene and Medical Statistics but confined himself in his address to the method as applied to insane women.

With about 165 men and 158 women in 1913 thus boarded out in families, Dalldorf probably takes the lead in this respect among all German insane asylums. Under all circumstances acute psychoses and patients with serious delusions, conditions of excitement and habitual criminals are excluded from this form of care. It is suited for those who have become quiet and harmless but are moderately confused and are no longer in need of institutional care, the higher idiots and semile cases that are not yet decrepit. Also convalescents after acute mental disturbance who cannot yet maintain themselves independently and those cases in which the attempt is made to secure improvement by the transition to conditions of greater freedom are also included in this class. A notable institution was established two years ago by Moeli at Herzberge, which consisted in a station for advice for discharged mental cases who are given both advice and actual assistance.

The selection of the boarding-out home is a very difficult and responsible matter; the majority of homes available are totally unsuitable. Thorough investigation which must be verified personally by the attending physician, must precede the assignment of a patient. The majority of the homes are found in Berlin and Charlottenburg. A fifth of the female wards are placed in private asylums, a third in the care of their own family or with relatives. Often these places prove to be inferior because in the selection account must be taken of the kinship. In general the value of a home is in the reverse relation to the rent of the house; the nearer to the center of the city and to the aristocratic districts, the less it is adapted for this purpose.

The best caretakers are quiet people of kindly dispositions who are grateful if they find a companion in the person for whom they are caring and can pay their rent with the board money. It is at most $7.50 (30 marks). A contract is made between the caretaker and the directors of the asylum. The boarded-out wards are visited by attending physicians as often as necessary and receive treatment in case of sickness if the district physician for the poor does not attend. Twice a month the wards with their caretakers present themselves at Dalldorf. Frequently the asylum is imposed on as the caretakers do not keep the insane ward at their own house but have them cared for by others. Often indeed it is the relatives, as has been shown by many instances, who treat their wards in this way. Sometimes also the female wards get married, and still more frequently, unfortunately, illegitimate pregnancy occurs in weak-minded young women if they are not entirely crippled and repulsive.

The boarding-out system occasionally permits a patient without friends to work her own sewing machine and become capable of earning something under the protection of the asylum. Most of the wards are not employed on account of physical disability. On the other hand, a large number especially the wards in private asylums are occupied to a slight extent in household duties. Many knit stockings for the asylum and so earn a few pennies. Five help the caretakers in commercial work on the sewing machine. Six female wards took care of the poultry and one milked the cow. Although this patient was entirely imbecile and needed constant oversight, yet the private asylum kept her without charge, for milkmaids are rare articles in Berlin. Four went out to mend or to sew; one went out sewing on her own account. To balance off a fairly competent working ward, it is often feasible for the private institutions to take a helpless imbecile as compensation. The private institution is fully equipped and licensed to enforce the strict regulations of the government but in this way can utilize space which is not required for patients.

A third of the female patients had to be taken back into the asylum again. These were not the patients who really needed no care but only assistance. They were those who seemed well on superficial acquaintance although their uncertainty and liability to relapse were known to the asylum. This class includes certain patients who suffer from periodic mania or periodic melancholia, on whom the experiment is always being made again to determine whether this isolated stage of the disease is past. Also physical diseases which last a long time make a return to the asylum necessary.

To determine by figures the success of this system of care in families with reference to the recovery of economic independence is difficult on account of the fluctuation of the population in a large city. However, in several cases, it has been possible to render self-supporting some who passed many years of their youth in the asylum and then were placed under care outside.

## Marriages

P. A. Surg. Robert Cathcart Ransdell, U. S. N., Washington, D. C., to Miss Dorothy Abbott Layman of Indianapolis, Ind., in New York City, July 15.

James Malcolm Thompson, M.D., Los Molinos, Cal., to Miss Maud Le N. de Bretteville of Lihue, Kauai, T. H., at San Francisco, July 8.

Francis Berger Trudeau, M.D., Saranac Lake, N. Y., to Miss Eleanor Helen Garretson of Morristown, N. J., July 8.

William O. Deyer, M.D., Marshfield, Wis., to Miss Nettie Nickerson of Oxford, Wis., at Stevens Point, Wis., May 30.

Paul Henry Anthony, M.D., Morris, Ill., to Miss Mary Wendolyn Fitzgerald of Chicago, at Chicago, June 30.

Harry William Bagenstose, M.D., West Reading, Pa., to Miss Margaret E. Foster of Camden, N. J., recently.

J. Kersey Davis, Conshohocken, Pa., to Ida Z. Anderson, M.D., of Phoenixville, Pa., in New York, recently.

George Emerson Baker, M.D., Odell, Ind., to Miss Alice Corbin of Louisville, Ky., at Trimble, Ky., July 3.

Harry Melchoir, M.D., College Point, N. Y., to Miss Catherine Manigan of Brooklyn, N. Y., recently.

William P. Buffum, M.D., Boston, Mass., to Miss Constance Arnold of Providence, R. I., July 29.

Logan Clendening, M.D., Kansas City, Mo., to Miss Dorothy Hixon of La Crosse, Wis., July 22.

Walker Haliburton Powe, M.D., to Miss Helen Dunbar Mauldin, both of Greenville, N. C., June 30.

Albert Smilie Hague, M.D., Fairfield, Ia., to Miss Pearl Wire of Kinsley, Kan., at Kinsley, July 6.

Charles Robert Blake, M.D., Dillon, Mont., to Miss Elizabeth Groeneveld of Butte, Mont., recently.

Herbert F. True, M.D., Los Angeles, Cal., to Miss Ruth Arnold of Long Beach, Cal., July 15.

Walter Cary, M.D., Cleveland, Ohio, to Miss Laura Latner of Dubuque, Ia., July 6.

Clyde William Bice, M.D., Ritzville, Wash., to Miss Wolfe of Iowa, at Vancouver, recently.

Clarence W. Cook, M.D., to Miss Carrie Stallard, both of Los Angeles, Cal., June 27.

## Deaths

**Augustus Barton Knowlton, M.D.** Medical College of the State of South Carolina, Charleston, 1893; a Fellow of the American Medical Association; formerly president of the Columbia Medical Society, and vice-president of the South Carolina and Tri-State Medical Societies; founder of the Knowlton Hospital, Columbia, S. C.; died at his home in that city, aged 46.

**Henry Clay Eno, M.D.** College of Physicians and Surgeons in the City of New York, 1864; a specialist in diseases of the eye and ear; formerly attending surgeon at the New York Eye and Ear Infirmary; a member of the Medical Society of the State of New York; died at his home in New York City, July 16, aged 74.

**Albert Ferdinand Boretti, M.D.** Harvard Medical School, 1911; a Fellow of the American Medical Association; head of the department of pathology and bacteriology at Marquette University School of Medicine; aged 29; died at a hospital in Milwaukee, July 13, after an operation.

**John B. Armstead, M.D.** Kansas Medical College, Topeka, 1900; a Fellow of the American Medical Association and of the Kansas Medical Society; formerly of Winchester, Kan.; district surgeon for the Union Pacific Railroad; died at his home in Topeka, Kan., July 9, aged 36.

**William Edward Howard, M.D.** St. Louis College of Physicians and Surgeons, 1890; Bellevue Hospital Medical College, 1898; of Ohio, Ill.; a Fellow of the American Medical Association; was instantly killed by the overturning of his automobile, May 20, aged 49.

**Benjamin Moody, M.D.** Geneva, N. Y., Medical College, 1868; Jefferson Medical College, 1869; a veteran of the Civil War; and a well-known practitioner of Mansfield, Pa.; died at his home in that place, June 24, aged 73.

**Henry Kremers, M.D.** University of Michigan, Ann Arbor, 1876; a Fellow of the American Medical Association; for thirty-two years a practitioner of Holland, Mich., and formerly mayor of that place; died at his home in Holland, July 15, from nephritis, aged 64.

**Joseph Warren Hilliers, M.D.** University of Pennsylvania, Philadelphia, 1860; a member of the Medical Society of the State of Pennsylvania; for more than fifty years a practitioner of West Middlesex, Pa.; died at his home in that place, recently, aged 75.

**Edward Wilson, M.D.** Hahnemann Medical College, Chicago, 1897; hospital steward of the Eleventh Michigan Infantry during the Civil War; and a resident of Elmhall, Mich., for forty-three years; died at his home in that place, July 9, aged 84.

**Clement A. Jennings, M.D.** University of Pennsylvania, Philadelphia, 1857; a member of the Missouri State Medical Association; for more than thirty years a practitioner of Salisbury, Mo.; died at his home in that place, June 9, aged 76.

**James J. Knott, M.D.** Atlanta, Ga., Medical College, 1859; said to have been the youngest surgeon in the Confederate service during the Civil War; for nearly half a century a practitioner of Atlanta, Ga.; died at his home in that city, July 12.

**Sheldon Fitch Davis, M.D.** State University of Iowa, Homeopathic Department, 1879; a Fellow of the American Medical Association and of the Southern California Medical Society; died at his home in Pomona, Cal., June 28, aged 60.

**Rufus Pitts, M.D.** University of the South, Sewanee, Tenn., 1901; for several years secretary of the Rutherford County Medical Society; died recently at his home in Murfreesboro, Tenn., from suppurative disease of the lungs, aged 40.

**Lemuel Conant Grosvenor, M.D.** Homeopathic Hospital College, Cleveland, 1864; for thirty-seven years a practitioner of Chicago, and for seven years a resident of Taunton, Mass.; died at his home in the latter place, July 17, aged 82.

**James Orrin Emmett, M.D.** New York Homeopathic Medical College and Flower Hospital, 1865; for nearly half a century a practitioner of Fonthill, Ont.; died at his home in that place, April 30, from heart disease, aged 71.

**William Edward Magruder, M.D.** University of Maryland, Baltimore, 1854; a member of the Medical and Chirurgical Faculty of Maryland; died at his home in Sandy Spring, Md., July 13, from cerebral hemorrhage, aged 80.

**William Dee Bollinger, M.D.** Homeopathic Medical College of Pennsylvania, Philadelphia, 1867; for forty-five years a practitioner of Lancaster, Pa.; a veteran of the Civil War; died at his home in Lancaster, Pa., July 13.

**Joseph Van Kirk, M.D.** Jefferson Medical College, 1891; a member of the Medical Society of the State of Pennsylvania; of Elizabeth, Pa.; died at Uniontown, Pa., June 18, aged 44.

**Aaron Herring, M.D.** Ensworth Medical Collegee, 1890; a member of the Kansas Medical Society; formerly of Highland Station, Kan.; died at his home in Sparks, Kan., July 9, aged 61.

**John Mason Brown, M.D.** University of Buffalo, 1864; for more than thirty years a resident of Westfield, N. Y.; died at his home in that place, July 12, from the effects of a fall, aged 72.

**John Wing Brown, M.D.** University of Michigan, Ann Arbor, 1873; for nearly forty years a practitioner of Skaneateles, N. Y., died at his home in Mottville, N. Y., July 9, aged 62.

**Henry William Webner, M.D.** Hahnemann Medical College, Philadelphia, 1875; for nearly forty years a practitioner of Baltimore; died at his home in that place, July 14, aged 62.

**Atherton B. Stevens, M.D.** Jefferson Medical College, 1880; for two terms a member of the state legislature from Wayne County; died at his home in Scranton, Pa., July 11, aged 57.

**Caleb Wakefield Clark, M.D.** University of Vermont, Burlington, 1889; a member of the Massachusetts Medical Society; died recently at his home in Melrose, Mass., aged 60.

**Michael Joseph Ahern, M.D.** Laval University, Quebec, Que., 1868; professor of practical anatomy in his Alma Mater; died recently at his home in Quebec, aged 70.

**Alexander L. Morris, M.D.** University of Tennessee, Nashville, 1883; a practitioner of Gulfport, Miss.; died at his home in that place, July 13, from heart disease, aged 54.

**Walker Aylett Hawes, M.D.** University of Virginia, Charlottesville, 1866; a Confederate veteran; for many years a practitioner of New York City, but since 1906 a resident of Charlottesville, Va.; died at his home, July 5, aged 74.

**John Merrit Lewis, M.D.** Bellevue Hospital Medical College, 1880; a Fellow of the American Medical Association; for thirty years a practitioner of Minneapolis, Minn., died at his home in that city, July 1, from uremia, aged 56.

**Mason O. Wert, M.D.** Columbus Ohio Medical College, 1878; for twenty-five years a practitioner of Wyandot and Holmes counties, Ohio; died at his country home in Sycamore, July 3, from arteriosclerosis, aged 65.

**P. C. Sutphin, M.D.** Philadelphia College of Medicine and Surgery, 1850; for many years a practitioner of Canmer, Ky., but recently a resident of Cave City; died at his home, July 6, from senile debility, aged 88.

**Carroll Everett Proctor, M.D.** Dartmouth Medical School, Hanover, N. H., 1881; from 1894 to 1902 superintendent of schools of Weld, Maine; died at his home in Weld, May 13, from chronic lead poisoning, aged 55.

**James C. Rippard, M.D.** College of Physicians and Surgeons, Baltimore, Md., 1881; a member of the Medical Association of Georgia; died at his home in Waycross, Ga., July 4, from heart disease, aged 56.

**David L. Talkington, M.D.** College of Physicians and Surgeons, Baltimore, 1907; died at his home in Jacksonburg, W. Va., May 22, from the effects of poison accidentally self-administered, aged 37.

**Samuel Hodgens Ralston, M.D.** Western Pennsylvania Medical College, Pittsburgh, 1896; prominent as a dentist of Pittsburgh; died at his home in Avalon, Pittsburgh, July 3, aged 45.

**Arthur Francis Eife, M.D.** New York Homeopathic Medical College, New York City, 1881; formerly a practitioner of New York City; died at his home in Elmhurst, L. I., July 9, aged 52.

**Omer P. Phares, M.D.** Starling Medical College, Columbus, Ohio, 1884; formerly of Connersville, Ind.; died at his home in Liberty, Ind., May 26, from cerebral hemorrhage, aged 59.

**Harold T. Hoag, M.D.** Marquette University, Milwaukee, 1910; for two years a member of the faculty of his Alma Mater; died at his home in Racine, Wis., July 6, aged 28.

**Knud Martin Teigen, M.D.** New York University, New York City, 1882; of Minneapolis; after shooting his wife, shot himself through the head and died, July 4, aged 59.

**William McD. Amos, M.D.** College of Physicians and Surgeons, Keokuk, Ia.; a pioneer practitioner of Lordsburg, Cal.; died at his home in San Dimas, Cal., July 2, aged 72.

**Milan Theron Ward, M.D.** Albany, N. Y., Medical College 1894; a Fellow of the American Medical Association; died at his home in Toulon, Ill., July 1, aged 55.

**C. E. Kinsey, M.D.** Medical College of the State of South Carolina, Charleston, 1877; died at his home in Williams, S. C., July 3, from heart disease, aged 59.

**J. W. Montgomery** (license, Tennessee, 1889); for more than a quarter of a century a practitioner of Thurman, Tenn.; died at his home, July 2, aged 58.

**George S. Morgan, M.D.** New York Homeopathic Medical College New York City, 1879; died at his home in New London, Conn., July 5, aged 59.

**Shadrach Burton, M.D.** Eclectic Medical College of Pennsylvania, Philadelphia, 1871; died at his home in Dallas, Texas, July 6, aged 83.

**Landon Aubry Woodson, M.D.** Medical College of Virginia, Richmond, 1860; of Coal Valley, Ala.; died in Oakman, Ala., June 11, aged 78.

**John H. Redding, M.D.** Southern Medical College, Atlanta, Ga., 1881; died at his home Waycross, Ga., July 7, from pneumonia, aged 56.

**Edward W. Delcher, Jr., M.D.** Kentucky School of Medicine, Louisville, 1891; of Baltimore; died at Shadyside, Md., July 6, aged 51.

**James Morris Watson, M.D.** New York University, New York City, 1886; died at his home in Falmouth, Mass., June 7, aged 54.

**William S. Jones** (license, W. Va., years of practice, 1881); died at his home in Central Station, W. Va., May 31, aged 78.

**Webster M. Dyas, M.D.** Rush Medical College, 1896; died at his home in Arlington Heights, Ill., July 2, aged 52.

# The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

## W. J. CROZIER—QUACK

A Mount Morris, Ill., physician sends us a full-page advertisement from the *Mount Morris Index*, which we reproduce in miniature. The advertisement is one of a traveling quack, W. J. Crozier, M.D., who calls himself "A Spanish Specialist in Chronic and Female Diseases." The physician who sends the advertisement writes:

"Each man has an aptitude born with him to do easily some feat impossible to any other"

W. J. CROZIERO, M. D.

Spanish Specialist in Chronic and Female Diseases

WILL BE AT

Quincy, Mich.

Monday, September 1st.

The Quincy House

For One Week Only

Examination Free

WHAT I CURE

The Battle of Death Against Microbes

Read!

Microbes That Kill

Health Report.

Word of Warning to Ladies

Fifteen Reasons Why You Should Consult Dr Croziero

DON'T PUT IT OFF NOW IS THE TIME

No Patients Consulted Until Tuesday Morning

Free Band Concert - 7:30 p.m.

A typical full-page newspaper advertisement of Quack Crozier when he was operating in Michigan. At that time he was going under the name "Croziero." After Michigan was made too hot for him he migrated to Indiana and later to Illinois where he now plys his trade as "CroZier." Size of original 13 in. by 21 in.

"I am enclosing a copy of an advertisement which appeared in our local paper last week. I shou'd like if possible to learn this man's standing in the profession, and whether he is licensed to practice in the State of Illinois.

"If you can assist me in this I shall be much obliged."

W. J. Crozier holds a diploma granted by the Missouri Medical College in 1881. In 1888 he received a license to practice in the State of Missouri and, according to the Missouri State Board of Health, at that time stated that he was a native of France. In 1910 he applied for a license to practice in the State of Michigan on the basis of his Missouri license. He applied not as W. J. Crozier but as William J. Croziero and, according to the Michigan State Board of Registration, at the time of his application said that he was born at Evansville, Ill. He is licensed also in Indiana and Illinois.

Of course Crozier's business, like that of all quacks, depends wholly on his ability to find newspapers which are willing to carry his advertisements. Fortunately for the Michigan public, that state has a law that protects, to some extent, the sick from vultures of the Crozier type. In October, 1913, W. J. Crozier, alias W. J. Croziero, was arrested in Paw Paw, Mich., and fined $50 for illegal advertising. The action on the part of the local authorities was due, largely, to the fact that Michigan has a wide-awake secretary on its State Board of Registration.

Finding Michigan too hot for him, Quack Crozier slid over the line into Indiana, in which state he continued his previous tactics. Crozier's method of getting victims is well described in a letter from a Williamstown, Mo., physician.

"He [Croziero] came to this town preceded by full-page advertisements in the weekly newspapers, large posters dis-

Each man has an aptitude born within him to do easily some feat impossible to any other

W. J. CroZier, M. D.

SPANISH Specialist in Chronic and Female Diseases

Mount Morris, Monday, July 20, 1914

At the Olson Hotel

For One Week Only

No Patients Consulted Until Tuesday Morning

Examination Free

I Treat Special Chronic and Female Diseases

TO THE WEAK AND SICK!

Free Lecture from my automobile at the Band Stand Monday evening, July 20. This lecture is for Ladies as well as Gentlemen. Free band concert at 7:30 p.m.

Music Furnished by Mount Morris Band

A greatly reduced photographic reproduction of a full-page advertisement of "Crozier" in the Mount Morris (Ill.) *Index*. The original advertisement measured more than one and one-half square feet.

tributed over the community telling that 'Dr. W. J. Croziero, the Spanish Specialist, would soon visit Williamstown, speaking four languages, having twenty-one diplomas from the largest schools in the United States, Germany and all over the world; able to diagnose any disease without asking the patient a single question,' etc.

"The first night in town he gave a free lecture, everybody invited. His prices were from $35.00 to $75.00, payment strictly in advance, and if check was given, his wife cashed checks immediately before any medicine was given. Dressed conspicuously, and did everything that you would expect the advertiser to do."

And now, it seems, Michigan, Indiana and Missouri have passed W. J. Crozier, M.D., Spanish Specialist, on to Illinois. In Illinois, Crozier has dropped the final "o" previously tacked on to his name and has capitalized the "z".

Crozier's advertisements are typical of the traveling quack. Lying claims regarding his ability, testimonials, and the

usual farrago of nonsense relative to the mysterious methods alleged to be used.

"I cure Cancer and Ulcers by electricity and blood medicine."
"I cure Epileptic Fits, Paralysis, Shaking Palsey and other nervous troubles."
"I cure Skin Diseases, Boils and Gall Stones."
"I cure Female Diseases by the latest scientific treatment; no embarrassing examinations."
"I cure that palpitating heart."

Here is a testimonial served up to the Mount Morris public, presumably in the hope of catching other victims:

"I had doctored several years for what the doctor called stomach trouble, but received no benefit. I consulted Dr. Crozier. He said I had tape-worm and removed same, which was 42 feet in length.—Matt. Rem."

Why Crozier left Indiana, we do not know, but we have a theory. Some of the country newspapers in that state that are particular about the class of advertising they carry, wrote to THE JOURNAL some months ago asking for information regarding Croziero, who apparently was applying for advertising space. Such information as we had was sent to these publishers. About the same time *Collier's* had something to say about Crozier and added: "Indiana newspapers will do well to think twice before accepting this impostor's advertising."

The amount of advertising space that Crozier purchases makes the acceptance of his advertising "copy" a great temptation to a struggling country newspaper. THE JOURNAL'S experience has been that the average country newspaper stands for decency and that, when its publisher can be convinced of the evident fraudulence of such individuals as Crozier, he will refuse to sell space to the quack. It is for this reason that THE JOURNAL takes the present opportunity of stating definitely:

1. W. J. Crozier, alias W. J. Croziero, is a quack.
2. The claims made by W. J. Crozier, alias W. J. Croziero, are false and fraudulent.
3. The newspaper that has the interest of its readers at heart should give the same short shrift to quacks of the Crozier type that they would give to "thimble riggers," "green goods" artists, "gold brick" dispensers, or any other individuals who make it a business to prey on the community and obtain money under false and fraudulent pretenses.

## Correspondence

### The Psychic Factors in Aviation

*To the Editor:*—I have read with some interest the abstract of the article by Loewy and Placzek on this subject (THE JOURNAL, July 11, 1914, p. 203). I do not know how much this subject interests the medical profession, but I cannot allow a notice like this to pass without giving my views as a practical aviator.

I have repeatedly flown at heights in excess of 4,000 meters (about 2½ miles). When I won the Tri-State Race going from Boston to Nashua, N. H., to Worcester, Mass., to Providence, R. I., and back to Boston I flew at practically this height during the entire distance.

I have always believed in high flying. I am convinced that it is far less dangerous than flying low. In the first place the vertical air-currents which annoy the aviator at low altitudes have no effect at great heights. The horizontal air-currents, corresponding to the winds on the surface of the earth, have little effect on the machine, as once the aviator is off the ground his speed with respect to the air passing him is constant. His speed with relation to the surface of the earth of course varies with the velocity of the horizontal air-currents.

The parties who made the tests under consideration put themselves in a cabinet with the atmospheric pressure corresponding to that of an altitude of 4,000 meters. Probably neither of them had ever been in the air. They, therefore, imagined all sorts of things that might happen. But let me tell you there is a great difference between two men cooped up in a little cabinet under artificial conditions and the same men flying free through the clear atmosphere at a height of 2 miles. The physiologic conditions may be the same in both cases, so far as the air-pressure is concerned, but the psychologic conditions are entirely different. The former must be depressed by the very nature of the trial, while the latter would be exhilarated in the highest degree.

As a rule, when a person goes into the air for the first time, the earth seems to be falling away from him while he remains stationary. At a height of perhaps half a mile the earth assumes a concave appearance. It is interesting to note that the only way you can tell the difference between woodland and grass is that the latter is lighter in shade than the former. This is no doubt due to the fact that the sunlight is reflected more readily from grass than from dense woods.

The fields in an open country give the appearance of a checker-board stretched out beneath the aviator. At the height of a mile ordinary roads have the appearance of a thin brown thread laid on the surface of the earth. If you happen to look at a railroad so that the rays of the sun are reflected into your eyes, the railroad appears like two piano-wires stretched on the ground.

This recalls an interesting time I experienced in the Tri-State Race mentioned above. The glass roofs of the greenhouses reflected the light into my eyes and I mistook many of these greenhouses for small ponds. A pond reflects the sunlight into the eye just as does the glass roof of a greenhouse. It is almost impossible to tell the difference between a very small pond and a large greenhouse at considerable height when the sun is shining so that the incident rays are reflected into the eyes.

I do not know why, but it seems to be a general impression that an aviator has difficulty in breathing, owing to the high speed of his machine and the rarefaction of the air. This is not the case. I have been with Bruce-Brown at a speed of 109 miles in an automobile on the Florida beach; I have driven my own car at a speed of 86 miles at Atlantic City, and I have been in an aeroplane at the speed of over 150 miles an hour (with the wind of course) and I had no difficulty whatever in breathing in any case. Furthermore, an aeroplane, properly designed, is so constructed that a great deal of this wind is done away with.

I have not found that the rarefaction of the air interferes with breathing, owing, I believe, to the fact that the aviator climbs so slowly that he has plenty of time to get used to the diminished atmospheric pressure. Another point which makes aviation different from mountain-climbing in this regard is that the mountain-climber is exercising and necessarily would notice rarefaction of the air before an aviator would who is sitting still.

In coming down, however, it is a different proposition. If I cut off my engine at a 2-mile height and drop suddenly to a mile from the ground, it seems as if some one were standing behind me and poking red-hot pokers into my ears. I had no difficulty whatever in going up because I went up slowly, but in coming down quickly I did not have time to become accustomed to the rapid change in atmospheric pressure. My usual practice, when I wished to avoid this inconvenience, was to drop a thousand feet as slowly as possible with the power off, turn on the power and circle around at that level, swallowing vigorously. I would then drop another thousand feet. In this way I could get to the ground from a height of 2 miles without any inconvenience.

As far as the rarefied air paralyzing the action of the subjective mind is concerned, I do not think that there is anything in this report. My experience has been that the objective mind, at least, is stimulated by the excitement of rushing through the air at high speed, the great purity of the air at great height, and possibly by the greater actinic power of the sunshine.

I found that I burned very much easier at great height than I did on the ground. This is probably due to the fact that the ultraviolet rays, which are of course the shortest in

wave-length, are less reflected by the particles in the air at a height of 2 miles than at the surface of the ground. In other words, the dust-particles intercept these ultraviolet rays, which are of course the most important in affecting the skin.

With regard to the death of Chavez: At Columbus I thought I would do a little grandstand work and drop from the height of a mile straight to the ground as rapidly as possible. I stepped out of the machine with everything swimming before my eyes and just as my foot touched the ground I became unconscious and remained unconscious for five minutes or so. This was no doubt due to the rapidity of my descent and this may have caused Chavez to lose control of his machine when only 100 feet from the ground. This, as I said before, is the only time when an aviator is inconvenienced.

I think my experience is not unusual compared with that of all aviators who fly at all high. The monoplane I used was the French Bleriot with a 70-horse-power Gnome motor. My flying speed was 72 miles an hour, and I could not remain in the air unless I drove my aeroplane at least 60 miles an hour. In five months I made 107 flights, which does not count the flying I did in Europe and while learning. I have also flown the Farman biplane and the Curtis biplane and, hence, my experience has been such as to warrant me in saying that my impressions are probably those of most aviators who have flown at all extensively.

If you think this matter is worth a discussion, I should be glad to answer any inquiries through THE JOURNAL which may be put to me.

EARLE L. OVINGTON, Newton Highlands, Mass.

[COMMENT.—There seems to be a discrepancy between experimental and actual conditions in this matter. Many observations have shown the ability of the body to accomodate itself to much higher altitudes than 2¼ miles. Apparently the difficulty in aviation (as in work in caissons) is, in part at least, due to the suddenness of the changes.—ED.]

### "Butter-Fat in Infant Feeding"

*To the Editor:*—In THE JOURNAL (July 18, 1914, p. 246) occurs an editorial on "Butter-Fat in Infant Feeding," which attributes the discovery of the remarkable influence of butter- and egg-fats on growth as contrasted with certain other fats of both animal and vegetable origin, to Osborne and Mendel. Foot-Note 4 states that McCollum and Davis have also pointed out this property for egg-fat, but makes no other reference to our work on this line. The facts in the case are as follows:

In the *Journal of Biological Chemistry*, 1912, xii, 81, Osborne and Mendel discussed the importance of lipoids in the diet during growth, and concluded that their data demonstrated that all lipoids were dispensable from the diet during growth (p. 88). One year later McCollum and Davis (*Jour. Biol. Chem.*, 1913, xv, 167) described for the first time that rats could grow for from eighty to 120 days on fat-free diets (Osborne and Mendel's experiments covered only sixty days), but invariably growth became suspended. We called attention to the fact that the addition of lard or of olive-oil would not induce a resumption of growth nor would lecithin or cholesterin, but that the addition of either butter-fat or egg-fat to the diet of purified food substances caused a prompt resumption of growth—a thing which never occurred unless fatty substances were added. One month after the appearance of our paper Osborne and Mendel published another paper (*Jour. Biol. Chem.*, 1913, xv, 311), in which they showed that the addition of *unsalted butter* to their "synthetic diet," which was not made up of purified food substances but contained "protein-free milk," would induce growth far longer than the same diet without the butter addition. It was in this paper that they first called attention to the fact that a suspension of growth always took place when a fat-free diet was fed. They admit that their butter contained about 15 per cent. of all the constituents of milk other than the fat, so that the results of their work as reported in this paper cannot be accepted as proof that the renewed growth was the result of the fat or some other constituent of the butter, for Hopkins had already pointed out that almost insignificant amounts of milk added to a diet of purified foodstuffs induced growth, when without it none was attained. It was not until four months after the appearance of our paper that Osborne and Mendel published work with purified butter-fat, fully confirming our own observations (*Jour. Biol. Chem.*, 1913, xvi, 423). They have not added to our results but have fully confirmed them.

I am presenting this history of the case to make it clear that the writer of your editorial has overlooked the actual discovery concerning both butter- and egg-fats, and gives the impression that we have confirmed Osborne and Mendel, whereas the reverse is true. It is a matter of injustice to give this false impression in an editorial of a journal having so wide a circulation among scientific men as does THE JOURNAL. I therefore ask that you request the writer of your editorial carefully to go over the literature cited and verify the statements I have made. I am sending you enclosed a copy of our papers on this subject. I hope you will find an opportunity at an early date to rectify this mistake in your editorial column.

Thanking you for giving this matter your attention, I am,

Yours very truly,

E. V. MCCOLLUM, University of Wisconsin, Madison, Wis.

[COMMENT.—We are glad to add the foregoing comments to supplement and correct the editorial referred to.—ED.]

## Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

### FRUIT ACIDS AND THE BLOOD—TYPHOID VACCINE AND CARRIERS—VERACOLATE A PROPRIETARY NOSTRUM

*To the Editor:*—1. What is your opinion of the use of fruit acids in the treatment of gouty and rheumatic conditions? Do fruit acids enter the blood or tissues as acids or alkalies?

2. What is your opinion on the use of typhoid vaccine in typhoid carriers?

3. What is your opinion on the use of Veracolates, Marcy Company, Boston, in gall-stone and gall-bladder affections?

4. What is your opinion of ox-bile pills covered with salol in gastric ulcer?

J. W. HOPKINS, M.D., Melrose, Mass.

ANSWER.—1. The fruit acids are neutralized in the intestines, forming salts. Such salts become oxidized in the tissues with the production of carbonates. This is a general statement but it does not apply to tartrates to so great an extent as to the citrate and other salts. The tartrates are not completely oxidized to carbonates and in large doses may exert an unfavorable influence on the kidneys. Fruit acids tend to decrease the alkalinity of the blood temporarily by withdrawing the bases by which they are neutralized. This effect is slight in ordinary cases so that it is commonly but incorrectly considered that the fruit acids are converted into alkaline carbonates. They can become converted into carbonates only by combination with a base and subsequent oxidation. An excess of a fruit acid tends to lower the alkalinity of the blood and to increase the acidity of the urine. The purpose of giving compounds of the fruit acid is to secure the effect of alkalies and this is best obtained by administering not the acids themselves, but their salts. The salts of the ordinary fruit acids are useful whenever it is desired to increase the alkalinity of the blood and diminish the acidity of the urine. Important investigations indicate, however, that it is scarcely feasible to produce any marked effect on the alkalinity of the blood in this manner. If the physician believes, as many do, that the alkalinity of the blood is an important factor in the recovery from conditions like gout and rheumatism, the administration of the salts of the fruit or vegetable acids is very appropriate if large quantities of tartrates are avoided.

2. Typhoid vaccine is suitable in the treatment of typhoid carriers, although in some obstinate cases it does not prove effective.

3. Veracolate is said to consist of the salts of the essential bile acids, sodium glycocholate and sodium taurocholate with cascara and phenolphthalein. Bile salts have the effect of increasing the secretion of bile. It is very doubtful whether this increase in the secretion of bile is of any special value in the treatment of gall-bladder affections. In any case there is no occasion for a proprietary mixture of the bile salts with fixed quantities of cathartics, as it is perfectly easy for a physician to prescribe such doses of cathartics as a patient needs without giving them in a proprietary mixture in which they will be frequently given when not needed. The advertising literature of Veracolate shows a tendency to extravagant statements which no physician ought to encourage. For instance, the statement is made that "Veracolate is a biliary disinfectant." Slight antiseptic action has been attributed to the bile salts, but there is no warrant for saying that they have disinfectant power.

4. Ox-bile pills may be of service in gastric ulcer if it is desired to increase the flow of bile. They are hardly to be regarded as an important medicament for this condition. The coating of pills with salol is a common practice to prevent the action of the gastric juice. It should be remembered that if the coating exceeds a very thin layer, a large amount of salol may be given.

### CONGENITAL ABSENCE OF AN EXTRINSIC OCULAR MUSCLE

*To the Editor:*—Please inform me if the congenital absence of an ocular muscle (extrinsic) has ever been noted.

WESLEY BISHOP, M.D., Regina, Saskatchewan.

ANSWER.—Although the occurrence of this anomaly is exceedingly rare, it has been observed and reported a number of times. Perhaps the most recent case is that of Mittendorf (*Manhattan Eye, Ear, and Throat Hosp. Rep., February*, 1914), who reports the case of a man aged 52 with a congenital absence of the right inferior rectus, and also the absence of Tenon's capsule over practically the lower portion of the eyeball. The family history in this case is somewhat significant. The patient is the fourth of a family of ten children, among whom four show marked congenital ocular defects. In this case the right eye was in a position of marked sursumvergens, pointing nearly directly upward, so that on elevating the lid, the lower border of the cornea was all that could be seen. During the operation to correct the faulty position of the eyeball, no trace of the inferior rectus tendon could be found. Up to the present time only about fourteen cases of congenital absence of an extrinsic ocular muscle have been reported in ophthalmic literature.

### USE OF LEAD AND OPIUM WASH

*To the Editor:*—1. Why is lead and opium wash used on external surfaces, for sprains, trauma, etc.?

2. Is lead absorbed through the unbroken skin?

3. Is opium absorbed through the unbroken skin?

4. Is the combining of the two drugs attended by the formation of a new compound, which is absorbed through the unbroken skin?

W. S. COZART, M.D., Boston.

ANSWER.—1. The application of lead is thought to allay inflammation.

2. Yes, to some extent.

3. No.

4. There is no new compound formed.

### EISENZUCKER

*To the Editor:*—Please inform me about Eisenzucker. Where can I look up articles or references about it—dose, applicability in children, etc.? H. TROSSBACH, M.D., Colorado Springs, Colo.

ANSWER.—Eisenzucker or saccharated ferric oxid is official in several pharmacopeias, but not in the United States Pharmacopeia. It consists of a ferric hydroxid made soluble by the addition of sugar and a small amount of sodium hydroxid. It is said to be an efficient ferruginous preparation. The adult dose is 0.6 gm. or 10 grains. This may be dissolved in equal parts of water and syrup.

**Typhoid and Tuberculosis.**—Antityphoid vaccination has not increased other diseases, but, on the other hand, tuberculosis, the disease suspected of being increased, has decreased in the Army since 1908.—Will Shimer, *Jour. Ind. State Med. Assn.*

## *Medical Education and State Boards of Registration*

### RULES GOVERNING DRUGLESS THERAPY IN PENNSYLVANIA

According to a report received from Dr. J. M. Baldy, the Bureau of Medical Education and Licensure has adopted the term "drugless therapy" under which to license certain practitioners of medicine and has defined drugless therapy specially to include the following:

1. Any treatment having the spine for a base, including (a) chiropractic, (b) Napravit, (c) Spondylo-Therapy, (d) Chiropractic Spondylo-Therapy, (e) Neuropathy, (f) Any other treatment having the spine for a base not here specified.

2. Any treatment having the mind for a base. (a) Suggestive Therapeutics, (b) Metaphysics, (c) Vita-Therapy, (d) Magnetic Healing, (e) Any other treatment having the mind for a base not here specified.

3. Any system, method, science or art of treatment based on 1 and 2 which is in existence or may come into existence and not already specified under the above-named divisions.

The license issued to those practicing any branch of drugless therapy, will not confer the right to use the title of "Dr." Nor will it authorize the holder to practice pharmacy, dentistry, osteopathy, nor to treat persons sick with quarantinable diseases, nor to practice surgery, midwifery or medicine by the use of drugs administered internally or applied externally.

After July 1, 1914, no person will be admitted into Pennsylvania for the purpose of practicing any form of drugless therapy without having first fulfilled the following requirements:

(A) A preliminary education prior to entering on the study of drugless therapy equal to that required of medical students prior to entering on the study of medicine, these requirements to be passed on by the Bureau of Professional Education of the Department of Public Instruction.

(B) The satisfactory completion, at an approved school, of a course of study consisting of the following:

1. The first two years of study prescribed by the medical schools of this commonwealth excepting those portions relating to materia medica, pharmacy, pharmacology, toxicology and surgery.

2. A third year of study, including hygiene, preventive medicine, symptomatology, diagnosis, pathology and therapeutics relating to drugless therapy.

3. The satisfactory passing of a licensing examination conducted by the Bureau of Medical Education and Licensure, after having qualified on the requirements of 1 and 2, as well as on character and moral standing.

At the present time there is no school teaching drugless therapy in the United States which can fulfill these requirements. The Bureau of Medical Education and Licensure has, therefore, made arrangement by which students desiring to pursue these courses may obtain the required education in the following institutions:

University of Pennsylvania, Philadelphia.
University of Pittsburgh, Pittsburgh.
Temple University, Philadelphia.
Women's Medical College, Philadelphia.

The following is the method of procedure which must be adopted in order to obtain access to the courses of these schools:

1. The preliminary requirements equal to the medical students admitted to the school chosen must be fully satisfactory to the institution.

2. The applicant desiring to take the course required by the state will apply for admission as a special student to the institution he or she selects, asking the privilege of electing such course as they desire. The courses the applicant must elect are those specified under Section B, Subdivision 1, namely, the full and complete course as given to the medical student with the exception of those branches which are not necessary for the practice of drugless therapy, namely, materia medica, pharmacy, pharmacology, toxicology and surgery.

At the completion of each examination held by the institution, a notification is issued to the applicant that he or she has passed satisfactorily the given examination. These notifications must all be submitted eventually to the Bureau of Medical Education and Licensure, as proof of having satis-

factorily completed each course elected, before the applicant will be admitted to the state examination for drugless therapy.

3. During the third year the student will elect, in the institution in which he is enroled, the courses bearing on Hygiene, Preventive Medicine, Symptomatology, Diagnosis and Pathology. The same procedure as to certificates of having passed examinations and submission of the same eventually to the Bureau are to be followed.

In the meanwhile, the Bureau of Medical Education and Licensure will arrange to approve certain schools of drugless therapy in which the student may matriculate, in order to obtain the necessary instruction in the branch or branches of drugless therapy he may elect during his third year.

4. Eventually, as any schools of drugless therapy are brought up to the above requirements, they will be inspected by the Bureau of Medical Education and Licensure and approved, as sources from which drugless therapists may obtain their full course of instruction. Until such time comes, no applicant will be admitted to the Pennsylvania examinations for drugless therapy without having fulfilled the above requirements.

Any further information desired by any individual in regard to these matters will be furnished on application to the Bureau of Medical Education and Licensure, at Harrisburg.

## Book Notices

RENAL DIAGNOSIS IN MEDICINE AND SURGERY. Being a Handbook of the Theory and Practice of Functional Testing of the Kidney. By Dr. Victor Blum, Tutor in Urology of the University of Vienna. English Translation by Wilfred B. Christopherson. Cloth. Price $2.00 net. Pp. 144, with sixteen illustrations. New York: William Wood & Co., 1914.

So much discrepancy exists between our urinary findings and those noted post mortem that one cannot help wondering whether he is ever justified in placing great reliance on variations in the urinary output. The fact that albumin and casts may or may not mean a pathologic lesion of the kidneys has increased our uncertainty regarding diagnosis. This situation has led to the introduction of various tests of the functional activity of the kidneys. "The aim of recent advances in modern functional renal diagnosis is to substitute a diagnosis based on physiology for empirical rules, to complete the general judgment of the renal functions by 'topical' tests of the various separate functions of the kidney." Many of the tests advocated have been shown to be absolutely useless and unreliable. This is especially the case when these tests are used to decide the question of competency or incompetency of one kidney to do the work of two in cases in which surgical intervention is contemplated. Thus we find, for instance, that cryoscopy, both of the urine and blood, for which much is and has been claimed, shows little beyond the fact that the concentration of the urine or blood is within normal limits; but "the assumption of a satisfactory renal function from a normal freezing-point of the blood is only admissible as long as we do not identify 'satisfactory function' with anatomical intactness. As in diseases of other organs, so also in affections of the kidneys—diffused and surgical renal complaints—we find a certain capacity for compensation: i. e., the excretory function of the kidneys may, in spite of extensive disease, prove adequate, since the functional deficiency of the diseased part can be supplied either by compensatory hypertrophy of other parts of the kidney or by other means, such as hypertrophy of the heart in chronic nephritis. The osmoregulatory activity of the kidneys in such a compensated case need have suffered no harm, and the freezing-point of the blood may remain normal in spite of definitely proved anatomical lesions of the kidney." It is clear, therefore, that little reliance can be placed on this test, especially regarding prognosis or advisability of surgical intervention. The same criticism applies to many of the other tests introduced. Space does not permit a review or criticism of the various methods discussed by Blum, but it suffices to say that he advocates the following procedures as especially serviceable: (1) method of experimental polyuria as advanced by Albarran; (2) administration of indigocarmin as advised by Völcker and Joseph, and (3) use of phenolsulphonephthalein as originated by Rowntree and Geraghty. The latter test is fast becoming the most popular and reliable test at our disposal for the determination of renal incompetency or disease.

This little monograph is written in a clear and concise style. The translation is, for the most part, smooth and excellent. The book is to be recommended as a reliable guide to the methods of functional renal diagnosis and the reliance to be placed on them, as well as concerning the physiologic and pathologic principles on which such diagnosis is based.

DISEASES OF THE HEART. By James Mackenzie, M.D., F.R.C.P., LL.D., Physician to the London Hospital. Third Edition. Cloth. Price, $5.50. Pp. 502, with 264 illustrations. New York: Oxford University Press, 1913.

In this edition Mackenzie has added much new material, and there has been a genuine revision and liberal rewriting. More emphasis is laid on the findings of the electrocardiograph, and there is more clearly brought out the relation of symptoms and signs to altered physiology. Therapeutic measures, as the use of digitalis in auricular fibrillation, are explained on scientific principles rather than on the ground of empiricism. The book is up to date, well written, and from the publishers' point of view of printing, illustration and binding, all that could be desired. An appendix of nearly one hundred pages contains instructive records of a large number of illustrative cases. No one familiar with the literature of diseases of the heart will question Mackenzie's right to speak with authority, especially on questions connected with pulse-tracings and the use of the polygraph. At the same time there is uttered once in a while a note that is somewhat irritating in that it seems a little too dictatorial and fault-finding. The reader wishes to be instructed but does not care to be put in the class of "most physicians," or to be told that he will persist in not understanding a certain thing even though plainly told, etc. And in the earlier pages we cannot help resenting his intimations that teachers and writers as well as general practitioners have failed to grasp the importance of the heart-muscle and are still devoting a large part of their energies to the refinements of auscultation. We agree with most of what Mackenzie says in this connection, but we also agree with what some of his friends have told him, that much of what he says is "common knowledge" (p. 18), and we resent his imputation that writers and teachers and the best of the general practitioners are still hopelessly ignorant on these matters. To the student of heart disease the book is indispensable as embodying the riper views of a pioneer investigator. It is in no sense a text-book for the undergraduate, and is not so intended.

DIAGNOSTICS OF THE FUNDUS OCULI. (Comprising One Volume of Text with 238 illustrations and Two Portfolios Containing 79 Stereograms and 8 Diagnostic Cards; also Hand-Scope.) By Edward L. Oatman, M.D., Surgeon Manhattan Eye, Ear and Throat Hospital. Cloth. Price $25. Troy, N. Y.: The Southworth Company, 1913.

This is one of the noteworthy works on diseases of the eye printed in English during the past year. It consists of one volume, which may be regarded as the textual description of two large portfolios containing seventy-nine stereograms and eight "diagnosis cards" illustrating all the common and many of the unusual appearances of the ocular fundus. In addition to these stereoscopic views of the background of the eye, the volume of text is further illustrated by 234 cuts and four colored plates. Many of the former are reproductions of microscopic sections, and both artist and publisher, have succeeded in portraying the minute tissue-changes in a fashion not often attained in similar works. The same may be said of the stereograms. These stereographic views admirably reproduce the originals, and they certainly ought to be of great assistance to the student of ophthalmoscopic conditions. Although these carefully prepared volumes will be of service to the ophthalmologist, the neurologist and the general practitioner, yet we believe that

they are of particular value in teaching. The employment of the stereoscope to bring out the details of ocular fundal lesions has in these instances proved a great success, and the views cannot fail to interest as well as instruct the student. Each stereogram has conveniently printed above it a good description of what the observer ought to see, and this arrangement will, we believe, meet a demand for undergraduate and postgraduate teaching of ophthalmoscopy not covered by any other work. Every college in which a study of the alterations in the fundus oculi forms a part of the curriculum will surely need and will be much benefited by the use of these admirable adjuncts to teaching.

DIE ALBUMINURIE. Klinische und experimentelle Beiträge zur Frage der Orthostatischlordotischen und der Nephritischen Albuminurie. Von Dr. Ludwig Jehle, Privatdozent für Kinderheilkunde in Wien. Paper. Price 4 marks. Pp. 109, with thirty-seven illustrations. Berlin: Julius Springer, 1914.

In this monograph Jehle presents the clinical and experimental evidence on which he bases his conclusion that the so-called "orthostatic" albuminuria is always a "lordotic" albuminuria. During the period of development about the age of puberty, many persons acquire an inability to assume a proper carriage of the body. This leads not only to a lordosis, but also to various circulatory changes in various parts of the body. Those in the kidney are sufficient, in the mind of Jehle, to cause the albuminuria which is evident when the patient is erect (that is, when the lordosis is present). As the lordosis disappears when the subject is lying down, so also must the albuminuria, as the circulatory disturbances are not apparent under these conditions. Jehle further shows that albuminuria may be produced with a normal patient by inducing a lordosis in the recumbent position. It would seem, therefore, that the erect (orthostatic) position is not the essential feature of this type of albuminuria but, rather, the lordosis, as Jehle assumes. This monograph is commended to those interested in the causation and differentiation of the various types of albuminuria. The views presented are worthy of consideration, and the clinical evidence produced merits more than passing mention.

A HISTORY OF LARYNGOLOGY AND RHINOLOGY. By Jonathan Wright, M.D., Director of the Department of Laboratories, New York Post-Graduate Medical School. Second Edition. Cloth. Price $4.00 net. Pp. 357, with illustrations. Philadelphia: Lea & Febiger, 1914.

The author presents a chronicle of the growth of the specialty indicated in the title. As specialization in practice has led to development of detail and technic, so in the description of the advance of this specialty, much detail and description are necessarily included. This specialty is not, however, too greatly isolated. In each section of the book the relations to general medicine are traced and the subjects are closely linked together. Etymology, literature, religion, economics, etc., as they have contributed to the study of laryngology and rhinology, are woven into the thread of the story. The book is interesting, readable and instructive. If there be any adverse criticism it is that many sections seem too short.

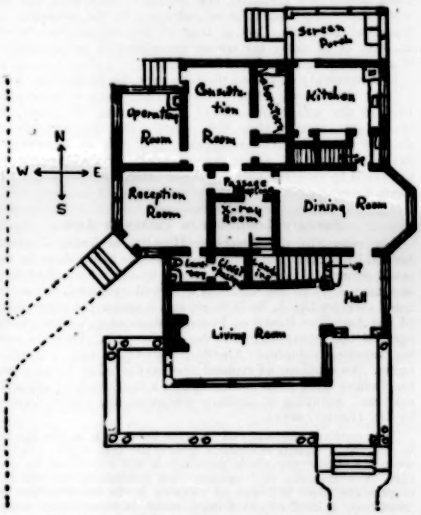
ABBAU UND ENTZÜNDUNG DES HERZKLAPPENGEWEBES. Von Professor Dr. Paul Grawitz, Direktor des pathologische-anatomischen Instituts der Universität Griefswald. Paper. Price, 2 marks. Pp. 32, with five illustrations. Berlin: Richard Schoetz, 1914.

This brochure relates the results of a study made by Grawitz of the growth of pieces of the heart-valves in culture-mediums. The conclusions which he reaches are confirmatory of views which he expressed several years ago, and emphasize the part played by the fixed tissues in processes of growth, repair and inflammation. The development of small, round wandering cells in hanging-drop cultures, the transformation of one type of tissue into another, and the bearing of these and other experimental observations on problems of biology and pathology are clearly stated, and the understanding of the subject made easier, by several excellent illustrations.

# Miscellany

## Combined Office and Residence

*To the Editor:*—I am sending the drawing of the main floor of my combined office and residence. It has proved very satisfactory. The idea was to keep the office and residence entirely distinct. The center of town is to the southwest, which accounts for the location of the entrances, the




Plan of main floor of combined office and residence.

office entrance being first seen, though the other entrance is on the more important street. The south and east exposures are 45 feet and 68 feet, respectively, including the porch.

H. W. OAKLEY, M.D., Porterville, Cal.

## The House-Fly and Infant Mortality

For a long time the house-fly has been accused of various criminal activities, the most serious of which in northern climates, is the transmission of diarrheal disease or summer complaint. In an effort to determine by means of social research with human beings as the subjects, the exact importance of the insect in this connection, the Department of Social Welfare of the New York Association for Improving the Condition of the Poor, through its Bureau of Public Health and Hygiene, conducted an experiment in New York City in the summer of 1913, involving the sanitation of an area in the Borough of the Bronx, the elimination of fly breeding in the neighborhood and the protection of the infants in the homes. A striking reduction in morbidity among the protected infants was obtained, and the work is described in detail by Dr. Donald B. Armstrong, director of the Department of Social Welfare (THE JOURNAL, Jan. 17, 1914, p. 200).

It was realized by the workers in this investigation that several complicating factors and uncontrollable variables threw considerable doubt over the statistical results, and consequently the study is being continued this summer. In order to ascertain the exact significance of the prevention of infection of the infant's food by flies, unsupplemented by the results of the generally improved sanitary environment,

the work this year is being confined strictly to the homes where the children spend most of their time. Widely separated Irish, Italian and Jewish neighborhoods have been chosen in Manhattan Borough, to ensure a geographical and racial balance, and about 1,200 infants selected and separated into protected and unprotected groups. The infants are Department of Health cases and the most generous cooperation of the Bureau of Child Hygiene of the Department of Health is being given to the experiment, half of the twelve nurses employed being supplied by the department. All cases are visited regularly and morbidity recorded, together with any factors possibly of influence in the causation of diarrheal disease. This is true of the unprotected babies as well as of those for whom everything is being done to eliminate fly dangers from their lives.

Is it necessary to screen the house for the protection of the infant? Is it worth while to take unusual care to protect the food of the infant from flies? Are netting, fly paper, fly traps, etc., worth what they cost? On the grounds of decency we may always answer "yes." Is it, however, a health measure of prime importance? This can only be answered by research such as is now being carried on in New York City.

### Sanitary Conditions in Turkey in Asia

The report of the American Hospital at Talas, Cesarea, for 1913 indicates that much good work is being done by the small American force there, assisted by the native physicians and nurses. The hospital, which is well equipped, has as its chief surgeon Dr. A. R. Hoover, and is under the supervision of the American Board of Foreign Missions. A total of 864 surgical operations was done during the year. There is need for another volunteer American physician and a trained nurse. An epidemic of typhoid fever occurred in Cesarea and the vicinity with about 300 cases and a death-rate of about 25 per cent. Speaking of sanitary conditions, the report, written by Dr. Hoover, says:

"The sanitary condition of Cesarea being as it is, the marvel is not that frequent epidemics attack the inhabitants; rather we wonder that the whole populace is not wiped out by disease. For instance, each summer and continuing into the fall months the chief industry of Cesarea is the manufacture of 'basdirma,' a kind of dried beef, which is mixed with spices and garlic and eaten raw. Many thousands of cattle are slaughtered for this purpose every year, and this without the slightest attempt at system or order. All through the city, in the streets or in open places, the cattle are slaughtered, and, the drainage being abominable, the resulting stench and the myriads of flies may be imagined better than written. With the breaking out of the typhoid epidemic the city officials gave orders to cease the manufacture of basdirma, but within a few days, on the plea that the business of the city was being ruined, the work was resumed and went on as usual. I was called to a case of typhoid; the patient having been sick for six weeks, developed meningitis and was in a hopeless condition. The house was that of one of the well-to-do basdirma manufacturers, house and factory being in the same stone-walled enclosure. While I examined the patient, the relatives left their work and came in to sit around and discuss the case with me, while the swarms of flies had free communication between patient and the great piles of exposed dried meat waiting shipment to Constantinople. The great need seems to be some means of spreading a more general knowledge of the common facts of healthful, hygienic living among the people, that they may come to realize their lack in this respect."

### Mutations in Bacteria

Experimental evidence which indicates that a given type of bacterium may be transformed into another and quite distinct type with altogether different cultural and infective characteristics has been brought forth by several authors within the past few years. R. T. Hewlett (*Nature*, April 23, 1914, p. 193) cites examples of mutations in bacteria and gives a brief summary of the recent work of Mme. Victor Henri (*Compt. rend. Sc.*, 1913, clviii, 1032).

Various alterations in the morphology and in physiologic characters of certain bacteria have been obtained by many observers. Thus, *Bacillus coli*, the plague bacillus and other organisms show considerable variation in the size of the cells on different culture-mediums; *B. prodigiosus*, which forms a brilliant red pigment when grown at ordinary temperatures, completely loses the power of pigment production after cultivation at blood heat, at which temperature (98 F.) it grows as luxuriantly as at 65 F. Twort and Penfold have educated the typhoid bacillus to ferment sugars which ordinarily it does not attack, and Revis has obtained marked varieties of *B. coli*, morphologic and physiologic, by prolonged culture in various mediums. Minchin holds that if there be no syngamy (sexual reproduction, that is, conjugation) among bacteria, as seems to be the case, the so-called species of bacteria are to be regarded as mere races or strains, capable of modification in many directions.

A marked instance of artificial production of mutations of *B. anthracis*, a particularly well-defined and stable bacterial species, is described by Henri. The method employed was to expose an aqueous suspension of sporing anthrax in a quartz tube to ultraviolet radiations for times varying from one to forty minutes, and afterward subculturing.

Whereas the majority of the organisms were killed by this treatment, the ultraviolet rays being markedly bactericidal, a few survived. Of the latter, while most presented a normal aspect, a few showed characters decidedly different from the typical anthrax bacillus. The principal of these were (*a*) coccoid forms which remained stable during a period of two months; (*b*) thin filamentous forms not taking Gram's stain, not liquefying gelatin, or curdling milk, and producing an infection different from anthrax on inoculation. This form remained absolutely fixed after daily subculture for more than eighty days; but, though stable *in vitro*, *in vivo*, after passage through an animal, Gram-positive coccoid forms made their appearance, and subsequently, after subculture in broth, a certain number of bacillary forms, approximating to typical anthrax, were obtained. These experiments open wide possibilities in the transformation of micro-organisms.

### Epidemiology of Buffalo Outbreak of Poliomyelitis

Frost and Leake of the Public Health Service have made an epidemiologic study of the epidemic of poliomyelitis which occurred in Buffalo and vicinity in 1912. The report of their work is given in a pamphlet issued by the New York State Department of Health. After giving in detail the method and the findings of their study, they summarize their conclusions about as follows: Nothing new or distinctly unusual in the epidemiology of poliomyelitis was found. In general characteristics and course this epidemic was similar to those studied in other cities. An infection probably present for years became progressively more prevalent without discoverable specific cause. It probably started from an ill-defined focus among the Italian population in June and July, extending practically over the entire city between that time and October, attacking about 1 in 1,400 of the population, chiefly children. In those groups in which the disease developed early, it died out early, while progressing in other groups. This indicates that the infection was independent of weather conditions, and gives the impression that the infection was universal throughout the city, but attacked only those susceptible and then died out in that particular section. The fact that only a small proportion of the patients had been in contact either directly or indirectly with any previously recognized case of poliomyelitis does not disprove the contagiousness of the disease or its direct transmissibility from person to person. It does prove quite conclusively, however, that if it is commonly so transmitted, the clinically recognized cases of poliomyelitis are relatively unimportant sources of infection. Mild, unrecognized cases or human carriers must be more important. The wide scattering of cases indicates that if transmitted by biting insects they must derive the infection from sources other than human cases, and that only a small proportion of persons bitten by such insects develop the disease in recognizable form. While it is possible that domestic animals or insects may be natural sources or reservoirs of the infection, there is at present no proof of this.

# Medicolegal

## Non-Validity of Law Authorizing Revocation of Licenses for Advertising Relative to Diseases of Sexual Organs

*(Chenoweth vs. State Board of Medical Examiners et al. (Colo.) 141 Pac. R. 132)*

The Supreme Court of Colorado reverses a judgment of the district court which sustained the State Board of Medical Examiners in revoking the license of Dr. Chenoweth to practice medicine for having published in a newspaper an advertisement relative, as was alleged, to a disease and diseases of the sexual organs. The supreme court holds unconstitutional the statute of the state authorizing the board to refuse to grant, or to revoke, a license to practice medicine in the state for "causing the publication and circulation of an advertisement relative to any disease of the sexual organs." The court says that the only statute of similar import brought to its attention was one of Nebraska, in which, however, were found the qualifying words, "tending to injure the morals of the public," not in the Colorado statute.

Advertisements by physicians may be regarded by certain members of the profession as contrary to professional ethics, but with that legislatures and courts may not be concerned. The legislature has no power to confer the authority on a board of medical examiners to deny to a physician the right to advertise his business. Doubtless, however, a physician might publish an advertisement which would in itself be so grossly immoral as to constitute dishonorable conduct. To say that an advertisement which may possibly refer to resultant effects of diseases of the sexual organs, but just as possible to be produced from other causes, injuriously affects the public morals is both prudish and absurd. The court can but take notice of the trend of the times and of the fact that societies and large numbers of respectable and moral people, including physicians, are urging that sex hygiene be taught in our public schools, in the interest of the public good and public morality.

The statute is clearly so indefinite as to render it invalid for that reason alone. Besides, the penalty provided is so grossly excessive and unconscionable as to make the statute repugnant to every sense of justice, if not to render it void for such reason. Because the statute makes the act an offense only when committed by a physician, it is for that reason clearly discriminatory, in that it applies to a class of citizens only, and for such reason alone is void.

The court must not be understood as in any sense declaring for the restriction of the exercise of the police power as heretofore announced, in cases in which the purposes are plainly for the public good, for it is the tendency of courts to make such new and other application of this doctrine as the ever-changing conditions and protection of society may seem to require. But there is a necessary limit to the invasion of the inherent and constitutional rights of the citizen beyond which legislative restriction may not go, if stable government is to remain.

## Exemption from Vaccination of those Conscientiously Opposed to it

*(Williams et al. vs. Wheeler et al. (Cal.), 138 Pac. R. 937)*

The District Court of Appeal, First District of California, says that, as the titles of the two Acts of 1889 and 1911 indicate, it is the policy of the state of California to encourage and provide for a general vaccination as the most effective method known to medical science for preventing the spread of an infectious and dangerous disease, and as such is a reasonable and proper health regulation, but it would [rather] seem to be the very opposite of a health regulation for a law, whose title declares its purpose to be "to encourage and provide for a general vaccination," to have embraced within it a proviso exempting from such vaccination those whose mental attitude is that of opposition to the avowed object of the law. The object and effect of such an exemption in such a case, as in this involving the question of exemption from vaccination, would be to defeat the very intent of the law itself, by an exception, not founded on considerations of health, destroying that generality within the sphere of its operation which would be essential to its effectiveness as a health regulation.

In the opinion of the court, therefore, the provision of the Act of 1911, which seeks to exempt those persons who are conscientiously opposed to the practice of vaccination from the operation of the law, otherwise general in its terms, requiring vaccination of persons seeking admission to educational institutions, is not in the nature of a health regulation. That being so, it is not such a proviso as would come within the general police powers with which the legislature is invested. Hence it cannot be availed of by those seeking enrollment in the University of California to nullify and avoid the operation and effect of the existing rule of the authorities of the university on the subject of vaccination.

## Construction of Statute with Reference to Privileged Communications

*(Booren vs. McWilliams (N. D.), 145 N. W. R. 410)*

The Supreme Court of North Dakota says that the statute of that state prohibits a physician from being examined as a witness, without the consent of his patient, as to any information acquired in attending the patient, which was necessary to enable him to prescribe or act for the patient. These provisions are most wholesome and salutary when applied to cases coming within the reasons for the enactment of the statute, but, if construed too strongly in favor of the patient, the beneficent effects intended to result from this enactment will be far more than overcome by the injustice which must in many cases result. To hold that any conversation, had by a patient with his physician while attending him as such, is privileged would be to render the phrase "which was necessary to enable him to prescribe or act for the patient" totally ineffective. In this case, an action for breach of promise of marriage aggravated by seduction, an offer was made to prove that the physician who attended the plaintiff during confinement, on a subsequent visit to her, was told by her that she did not have intercourse with the defendant until about six and one-half months prior to the birth of the child, that she never had had any talk with the defendant about marriage, and that the reason she let him have intercourse with her was that she thought, if she became pregnant, he would marry her. Under the circumstances surrounding the visit, it was apparent that such information, if given the physician, was not necessary to enable him to prescribe or act for the plaintiff, and therefore it was not privileged under the statute.

## Malpractice Liability of Surgeon Employed by Company

*(Hofman vs. Watkins (Wash.), 138 Pac. R., 664)*

The Supreme Court of Washington reverses a judgment obtained by the plaintiff for alleged malpractice in the treatment of an injury to one of his shoulders. The court says that the allegations were that the defendant carelessly and negligently failed to examine the shoulder properly and to ascertain its true condition, but improperly diagnosed the injury as a sprain, and treated it accordingly, when as a matter of fact the shoulder was dislocated. It was not necessary to establish a contractual relation between the defendant and the plaintiff, for it is clear that, whether the relation was that of physician and patient alone or whether the services of the defendant were engaged because of his contract with the lumber company, his duty to the plaintiff would have been the same. The authorities all agree that, so long as the relation of physician and patient exists, however that relation was formed or whether the service was gratuitous or for an expected fee, the physician owes his patient the same measure of duty and the same degree of care and skill and is to the same extent answerable for the failure of its exercise to the injury of the patient.

It is the duty of the court to make a plain and concise statement to the jury of what the triable issues are, to aid

them in determining the only controversy they are called on to determine. The defendant was entitled to have the jury instructed to the effect that negligence could not be inferred nor presumed from the failure to effect a cure, and that the condition of the plaintiff's shoulder subsequent to the defendant's treatment did not of itself establish an inference that the defendant had been negligent in his treatment.

## Society Proceedings

### COMING MEETINGS

Amer. Assn. of Obstetricians and Gynecologists, Buffalo, Sept. 15-17.
American Electro-Therapeutic Association, Battle Creek, Sept. 15-17.
American Roentgen Ray Society, Cleveland, Sept. 9-12.
Colorado State Medical Society, Boulder, Sept. 8-10.
Med. Soc. of the Mo. Valley, Des Moines and Colfax, Ia., Sept. 17-19.
Michigan State Medical Society, Lansing, Sept. 11-12.
Oregon State Medical Association, Portland, Sept. 10-11.

## Current Medical Literature

### AMERICAN

Titles marked with an asterisk (*) are abstracted below.

**American Journal of Diseases of Children, Chicago**

*July, VIII, No. 1, pp. 1-112*

1 *Respiratory Exchange of Infants. F. G. Benedict and F. B. Talbot, Boston.
2 *Case of Acute Chylous Ascites (Non-Fatty, Pseudochylous, Lactescent or Milky Type) in Boy Eight Years Old. F. Huber and H. M. Silver, New York.
3 Review of Literature on Feeding and Gastro-Intestinal Diseases of Infants, for Year 1912-1914. G. Meigs, Chicago.
4 Review of Syphilis with Especial Relation to Hereditary Syphilis. H. P. Towle, Boston.

1. **Respiratory Exchange in Infants.**—If, Benedict and Talbot state, it is maintained that the total metabolism is proportional to the body-surface, it should be stated that this is not due to the fact that there is a loss of heat from the body-surface and that Newton's law of cooling determines the intensity of the metabolism, but that with normal persons the body-surface, blood-volume, the area of the trachea and aorta, and probably the active mass of protoplasmic tissue, are all in simple mathematical relation to the body-weight. Thus the apparent relationship which has previously been observed between the heat-output and the body-surface with normal or nearly normal persons has an explanation in that with such persons a simple relation exists between the body-surface, blood-volume, body-weight, and the mass of active protoplasmic tissue.

In their series of observations Benedict and Talbot attempted to eliminate completely all muscular activity, to make the experiments under approximately the same conditions as to nutriment, to select such a diet as was least stimulating to the catabolism and to have the subject for the most part in deep sleep, thus eliminating psychic disturbances. They believe that their evidence points strongly and conclusively to the fact that the active mass of protoplasmic tissue determines the fundamental metabolism. The absence as yet of a direct mathematical measure of the proportion of active protoplasmic tissue does not, they believe, in any wise affect the convincing nature of our evidence.

2. **Acute Chylous Ascites.**—Aside from the presence of the chylous fluid, the case cited by Huber and Silver was interesting in many other respects. For instance: (1) The small amount of urine passed. Though only 8 or 9 ounces were excreted in twenty-four hours, there was no evidence of any systemic disturbances, as headache, nausea, vomiting, etc. (2) The general well being of the patient. Excepting the discomfort due to the distended abdomen, the boy did not make any complaint. The appetite was good and bowels regular. Pulse and temperature normal. (3) The rather unusual type of ascites with edema of the back, abdomen, thighs and genitals (ankles, legs and chest, not involved) and no edema of the face at any time throughout the course of the disease. (4) The rapid return of the fluid after tapping, presumably explained by the fact that a collateral circulation had not been established, as condition was rather acute. (5) The marked diminution in the amount of edema of abdomen, genitals, etc., after the tapping, and its rapid return when the puncture had healed. (6) The rapid subsidence of the external localized edema after operation. (7) The decided increase in the urinary excretion soon after operation, evidently the direct results of the removal of the intra-abdominal pressure and the establishment of peritoneal drainage. (8) The brilliant success of the surgical measure adopted.

Internal drainage was carried out as follows: Six strands of No. 7 white silk 4 inches long were caught in the grasp of a narrow-bladed dressing forceps, carried into the abdomen and thrust through the peritoneum to the outer side of the femoral vessels into subcutaneous tissues of the thigh, only half an inch of the silk remaining within the peritoneal cavity. This was repeated on the opposite side. At the upper angle of the wound six more strands of silk of the same length as used below were thrust into the subcutaneous tissues of the abdominal wall above the umbilicus, the lower half inch remaining within the abdominal cavity. Great care was taken to allow only a very little of the silk to project within the abdominal cavity, as it has been found by actual experiment that long silk strands may cause intestinal obstruction by forming attachments to the omentum or any organ within reach. The patient reacted well and his convalescence was rapid and uneventful. The dressings were removed at the end of a week and the wound was found completely healed, with no edema of its edges. There was some edema in the upper part of the right thigh, very little in the left thigh, and none over the upper portion of the abdomen. Five months after operation the boy was found to be in excellent health; the fluid had not returned. Abdomen lax, no masses could be felt on a most careful examination, nor could any thickening be made out in the neighborhood of the silk drains.

**American Journal of Medical Sciences, Philadelphia**

*July, CXLVIII, No. 1, pp. 1-156*

5 Ninety Cases of Acute Epidemic Poliomyelitis. F. R. Fraser, New York.
6 Gall-Stones Viewed from Surgical Standpoint. N. Jacobson, New York.
7 *Lange's Colloidal Gold Reaction in Cerebrospinal Fluid. R. I. Lee and W. A. Hinton, Boston.
8 *Effect of Extracts of Sheeps' Thyroid and of Pathologic Human Thyroid on Fatigue Curve of Voluntary Muscle. C. K. Drinker and K. R. Drinker, Philadelphia.
9 *Treatment of Imperfectly Descended Testicles. E. M. Corner, London.
10 Wassermann Reaction. B. A. Thomas and R. H. Ivy, Philadelphia.
11 Involution of Nasopharynx, and Its Clinical Importance. W. S. Bryant, New York.
12 Metabolism Studies in Case of Myasthenia Gravis. T. Diller and J. Rosenbloom, Pittsburgh.
13 Serum Diagnosis of Pregnancy and Its Underlying Principles. J. S. McLester, Birmingham, Ala.
14 Complement Fixation Test in Typhoid; Its Comparison with Agglutination Test and Blood Culture Method. A. L. Garbat, New York.
15 Relation of Lesions of Small Intestine to Disorders of Stomach and Cap as Observed Roentgenologically. L. G. Cole, Boston.

7. **Gold Reaction in Cerebrospinal Fluid.**—The authors' experience confirms the findings of other observers that the gold test is delicate, and that the margin of error is exceedingly small. A gold reaction typical for syphilis is nearly constant in cases of syphilis of the central nervous system.

8. **Effect of Thyroid on Voluntary Muscle.**—Desiccated sheeps' thyroid containing 0.2 per cent. of iodin was macerated by Drinker and Drinker in Ringer's solution isotonic for the frogs, and the filtrate contained the substance used in the experiments. By such a method only a small amount of the original material is represented in the filtrate, as the dried gland is but slightly soluble. The authors term filtrations which resulted from the use of 5 gm. of dried thyroid per 100 c.c. of Ringer's solution, 5 per cent. solutions; those

V. 19

which before filtration contained 1 gm., 1 per cent. solutions, and so on throughout the entire series. They found that Ringer's solution extracts of dried sheep's thyroid caused depression in 3 per cent. solutions. The depression gave way to slight stimulation between 1 and 2 per cent. of strength. At 1 per cent. there was usually no effect distinguishable from pure Ringer's solution. Similar material from cases of Graves' disease gave no equal amount of depression. Clinical observation on myasthenia gravis and exophthalmic goiter is suggestive in this relation. In addition there was irregularity in the strength of contractions, but the series is much too small to call this a specific attribute. Extract from cases of colloid goiter gave in most cases no depression; and in all less depression than was obtained with either the sheeps' thyroid or with extracts of parenchymatous goiters. There is no irregularity in the strength of contractions such as was noticed with the latter type.

**9. Imperfectly Descended Testicles.**—Corner is convinced that the operation of orchidopexy more frequently fails from atrophy of the gland than by not retaining that gland in a good position. The treatment suggested by Corner for the condition of imperfectly descended testicles is summed up from the point of view of the age of the patient, as the condition is a congenital one. At birth and up to the age of about 5 years of age he advises to watch the case to decide if the testicle is merely late in its descent or not. If a hernia is seen to be present, operate and conclude by doing an orchidoplasty. From 7 to 20 years of age, operate if a hernia is present or not; do either an orchidoplasty, an orchidectomy or an orchidocoelioplasty. Above 20 years of age, do an orchidectomy.

### Boston Medical and Surgical Journal

*July 16, CLXXI, No. 3, pp. 89-136*

16 *Salpingitis—Results of Treatment by Abdominal Approach. C. L. Scudder, Boston.
17 Case of Supposed Progeria (Premature Senility) in Girl of Eight Years. C. W. Rand, Boston.
18 Mushroom Poisoning. E. S. Bagnall, Hartford, Conn.

**16. Salpingitis — Results of Treatment by Abdominal Approach.**—In the series of 74 cases analyzed by Scudder there were 69 operations. There were 3 deaths following the operations, or an operative mortality of 4 per cent. One of these deaths was from shock following a right salpingectomy and an appendectomy, with drainage. There was 1 death due to a septic abortion, the operation being a dilatation and curettage. There was 1 death, evidently due to shock, following a right salpingectomy with drainage of pelvic cellulitis and an appendectomy. A report was received from 40 to 71 living patients out of the 74 total. Of the 5 treated without operation, only 1 reported and she was unrelieved. Thirty-six of the 39 operative results were reported relieved, or 92.3 per cent. Three of the 39 operated results were reported unrelieved, or 7.6 per cent. There were no extra-uterine pregnancies reported in the remote result of any case. Out of 9 cases having had a right salpingectomy and 3 cases having had a left salpingectomy, there were reported four subsequent pregnancies. In this series there was 1 salpingostomy. No pregnancy has resulted in this case.

Of the 39 operative results 2 cases reported a further operation, both of which followed a double salpingectomy. There were five patients who developed hernia in the operation scar, four following a double salpingectomy with a partial oophorectomy, and 1 following a left salpingo-oophorectomy with drainage. Of the 39 operated patients from whom a report was received 2 had double salpingo-oophorectomies. Both of these patients were relieved and there were no sequelae excepting a hernia in the scar in one case. Of the total 42 operations of double salpingectomy a report was received from 24 patients, 22 of which were relieved, 91.6 per cent. There were no operative deaths. Two patients were unrelieved by the operation. A double oophorectomy was done in 3 cases and a single oophorectomy in 18 cases, 5 patients had a curettage, and 12 patients had an appendectomy.

Of the 16 total operations of right salpingectomy a report was received from 9 patients, 8 of whom were relieved, 88.8 per cent. There were two operative deaths. One patient was unrelieved by the operation. A right oophorectomy was done in 8 cases, and an appendectomy in 4 cases. Of the 8 operations of left salphinectomy a report was received from 3 patients, all of whom were relieved. There was 1 operative death. A left oophorectomy was done in 4 cases and a right oophorectomy in 1 case; a ventral suspension was done in 1 case, and a curettage in 1 case. Of the 2 operations of division of adhesions a report was received from both, both being relieved, 100 per cent. An appendectomy was done in connection with one case. An exploratory laparotomy was done in one case in which nothing was found to account for the symptoms. The patient recovered and has no acute symptoms since. Of the 5 patients treated by hot douches, the symptoms in all rapidly subsided, and they were discharged relieved from the hospital. One of the 5 patients made a later report complaining of chronic symptoms. Four patients were not heard from.

### Bulletin of American Academy of Medicine, Easton, Pa.

*June, XV, No. 3, pp. 119-180*

19 Physical Bases of Crime. Z. R. Brockway.
20 Resume and Recommendations of Committee to Investigate Teaching of Hygiene in Public Schools. H. C. Putnam, Providence, R. I.
21 Larger Meaning of Medical Missions. J. A. Melrose, Minneapolis.
22 Modern Medicine in China. E. D. Vanderburgh, Siangtan, Hunan, China.
23 Mount Lebanon Sanatoria at Juneh and Chehanin, Syria. M. P. Eddy, Syria.
24 Caroline A. Ladd Hospital. J. H. Wells, Pyengyang, Korea.
25 American Presbyterian Mission, Canton, China. H. W. Boyd, China.
26 Work in Wei-Hsien. C. K. Roys, Wei-Hsien, Shantung, China.
27 Habit Producing Drugs and Crime. R. W. Wilcox, New York.
28 Head Injury and Syphilis as Cause of Crime. B. Glueck, Washington, D. C.

### California State Journal of Medicine, San Francisco

*July, XII, No. 7, pp. 263-302*

29 Fundamentals in Teaching Sex Hygiene. J. C. Hollister, Pasadena.
30 Treatment of General Paralysis of Insane. C. W. Mark, Agnews.
31 Swift-Ellis Treatment of Cerebrospinal Syphilis. P. K. Brown and W. T. Cummins, San Francisco.
32 Prostatic Carcinoma in Youth of Seventeen. S. J. Gardner and W. T. Cummins, San Francisco.
33 *Relation of Localized Tenderness to Site of Causal Lesion in Perforative Peritonitis. R. T. Stratton, Oakland.
34 *Butyric Acid Test (Noguchi) as an Aid in Diagnosis. F. F. Gundrum, Sacramento.
35 Tabulation and Differential Diagnosis of Liver Cases Occurring in Stanford Wards of City and County Hospitals During Past Few Months. R. W. Harbaugh, San Francisco.
36 Uncomfortable Babies. L. Porter, San Francisco.
37 Death Following Ant Bite. T. C. Edwards, Salinas.
38 Intracranial Pressure. H. C. Naffziger, San Francisco.
39 Echinococcus in California. J. R. Snyder, Sacramento.
40 Registration Law and Requirements for Accrediting Schools for Nurses. A. C. Jammé.

**33. Relation of Localized Tenderness to Perforative Peritonitis.**—As the result of personal observation Stratton is disposed toward the following conclusions bearing on the relation of localized tenderness to the site of the causal lesion. 1. The site of the perforated ulcer, as indicated by moderate abdominal palpation within several hours after the onset, is not uniformly intensely sensitive. 2. Neither is it always the most sensitive area. 3. In addition to the well recognized local symptoms referable to the region of the perforated ulcer and the appendix, other parts of the abdominal viscera may, exceptionally, be the seat of confusing sensitiveness.

The following is offered as a possible solution: The portion of peritoneum at the site of perforation in certain instances being subjected to continuous, prolonged irritation from an unusually concentrated and irritating extruded gastric contents, to which the tissues of some individuals may react differently than those of others, may after a time, lose something of its sensitiveness and fail to respond to increased stimulation by palpation. This condition would only be analogous to the well-recognized depression of nerve func-

tion, even paralysis, resulting from overstimulation in other parts of the body of motor and special sense nerves. Or as a result of local toxic and inflammatory influences, actual changes may take place in the delicate peritoneal nerve terminals that prevent the conduction of pain impulses. Coincidentally, other areas coming within the zone or spreading irritation, either for some reason naturally more sensitive or having been subjected to a less overpowering degree of irritation, by reason of their distance from the ulcer, may at this later period and at least temporarily, be relatively more keenly alive to pressure than is the original focus from which the irritation has come. That the greatest abdominal wall protective rigidity should then be over these now more sensitive parts does not seem to be strange or unreasonable; or that, as these new peritoneal areas are involved, symptoms referable to the newly affected part may stand out, at least for a time, with conspicuous boldness and attract and unduly hold the surgeon's attention.

At times the approximate site of perforation is susceptible of fairly close determination. But again, with an incomplete antecedent and recent history, a knowledge of which the sufferings of the patient or the ignorance or nervousness of his associates prevent the surgeon from gaining; with an atypical symptomatology; with other symptoms resulting from almost necessary complications of the primary disease pressing to the front and obscuring the original state; with the usual sighs of morbidity dissipated or altered by injudicious narcotic medication, the clinical picture may be so changed, that the diagnostic skill of the well-informed surgeon may be overtaxed.

**34. Butyric Acid Test as Aid in Diagnosis.**—In a series of 43 cases examined by Gundrum the butyric-acid test was positive in all instances in which marked inflammation or degeneration was going on in the cerebrospinal system. It was absent in diseases in which, although there seemed to be spinal involvement, no actual organic nervous lesion was present. In all doubtful cases simulating inflammatory diseases of the brain or spinal cord, spinal puncture is indicated. If the fluid is turbid, the butyric-acid test is superfluous. If the fluid is clear, the butyric-acid test enabled him to tell whether or not inflammatory or degenerative changes are taking place. In other diseases in which symptoms of meningeal irritation arise the obtaining of a clear spinal fluid which fails to show the butyric-acid test of Noguchi is of considerable moment, particularly in the matter of prognosis.

### Illinois Medical Journal, Chicago

*July, XXVI, No. 1, pp. 1-76*

41 Needs and Purposes of State Medical Society. C. J. Whalen, Chicago.
42 Simple Goiter Compensatory Hypertrophy; Its Symptoms and Relation to other Clinical Types. C. G. Buford, Chicago.
43 Rheumatism in Children. J. Brennemann, Chicago.
44 Considerations of Blood-Pressure. G. S. Bower, Galesburg.
45 Autogenous Vaccines in Treatment of Chronic Pus Infections. M. L. Mendel, Chicago.
46 Trichinosis and Typhoid. Report of Case. P. Chester, Chicago.
47 Value of Blood-Pressure in Interpreting Some Clinical Manifestations. H. A. Cables, E. St. Louis.
48 Hydrotherapy in Treatment of Insane. A. H. Dollear, Hospital.

### Journal of Experimental Medicine, Lancaster, Pa.

*July, XX, No. 1, pp. 1-91*

49 Present Condition of Strain of Connective Tissue Twenty-Eight Months Old. A. Carrel, Boston.
50 *Patching and Section of Pulmonary Orifice of Heart. T. Tuffier and A. Carrel, Boston.
51 *Experimental Operations on Sigmoid Valves of Pulmonary Artery. A. Carrel, Boston.
52 *Relation of Spleen to Blood Destruction and Regeneration and to Hemolytic Jaundice. Changes in Bone Marrow after Splenectomy. R. M. Pearce and O. H. P. Pepper, Philadelphia.
53 *Mechanism of Anaphylatoxin Formation. J. W. Jobling and W. Petersen, New York.
54 *Complement Fixation Tests in Chronic Infective Deforming Arthritis and Arthritis Deformans. T. W. Hastings, New York.
55 *Polyvalent Antigen for Complement Fixation Test for Streptococcus Viridans Infection. T. W. Hastings, New York.
56 Technic and Accuracy of Method of Douglas and Haldane for Calculating Dead Space in Breathing. E. P. Carter, Saranac Lake, N. Y.

**50. Patching and Section of Pulmonary Orifice Heart.**—The purpose of the experiments conducted by Tuffier and Carrel was to develop a technic by means of which the pulmonary orifice could be enlarged. The operation consisted in suturing to the anterior side of the orifice a venous patch which permitted an increase in the circumference of the orifice after the arterial wall had been incised. Although these operations were in the developmental stage, nevertheless only two animals died of the eight that were experimented on. One of these died on the operating table from fibrillary contractions, probably due to the fact that a branch of the coronary artery had been taken up by one of the stitches. A second dog died of pericarditis a few days after the operation. In the six other instances the animals sustained no shock after the operation, remained in good health, and were still normal more than six months after the operation. These experiments show that it is possible to perform an operation, the object of which is to increase the circumference of the pulmonary orifice without involving much danger to the life of the animal. The authors suggest that operations of this type may come to be employed in the treatment of stenosis of the pulmonary artery in man.

**51. Operations on Sigmoid Valves of Pulmonary Artery.**—Incision, suture and cauterization of the sigmoid valves of the pulmonary artery have been performed successfully by Carrel in dogs. In the first series of ten animals, there were only three accidents, probably from largely preventable causes, leading to the death of the animals.

**52. Blood-Destruction and Regeneration.**—The bone-marrow of splenectomized dogs has been examined by Pearce and Pepper with a view to determining the compensatory or other changes following the removal of the spleen. The material consists of marrows representing periods varying from three weeks to twenty months after splenectomy. During the early periods, one to three months, the change in the marrow is slight and either focal or peripheral; after six to twenty months the replacement of fat by marrow cells is complete or nearly so. Exceptions were, however, seen in four animals representing the eighth, ninth, tenth and twenty-second months, respectively. The evidence at hand does not support the theory that this hyperplasia is compensatory either to the anemia caused by splenectomy or to an increased hemolysis in the lymph-nodes. The authors suggest that it may be a concomitant of the activity of the bone-marrow in taking over, in the absence of the spleen, the function of storing and elaborating the iron of old blood-pigment for future utilization by new red cells, but their studies do not fully support this view.

**53. Mechanism of Anaphylatoxin Formation.**—The unsaturated lipoids (serum antitrypsin) Jobling and Petersen state can be absorbed from guinea-pig serum, rabbit-serum and horse-serum by kaolin, starch, agar and bacteria. Diphtheria toxin and cobra venom also reduce serum antitrypsin, possibly because of their affinity for lipoids. Anaphylatoxins represent sera rendered toxic by partial removal of serum antitrypsin. The matrix of the protein split products lies in the serum proteins so exposed. The amount of removal of serum antitrypsin depends on definite quantitative relations; very large amounts and very small amounts of absorbing substances are least effective (kaolin, starch and bacteria). Bacteria previously treated with serum or with oils do not absorb antitrypsin. Bacteria treated with serum become more resistant to the action of trypsin.

**54. Complement-Fixation Tests in Arthritis.**—From a comparison of the results with arthritis deformans and with control cases Hastings believes he is justified in concluding that *Streptococcus viridans* is an infectious agent and excites the production of a complement-fixing substance (fixateur) in the organism in cases of arthritis deformans, and, therefore, *Streptococcus viridans* is the probable causative agent of the disease in many cases of arthritis deformans. He claims that probably 40 per cent. and more of cases of arthritis deformans should be considered as chronic infective deforming arthritis. Rarely the clinical manifestations of arthritis deformans may be due to gonococcus infection. The

serum from one case may react positively to two different organisms, most frequently to *Streptococcus viridans* and to gonococcus, when the reaction to the former should be considered the indicator of the causative agent, since with the latter infection is often latent in the genito-urinary tract. Incidence of gonococcus infection is high and the clinical manifestations of arthritis deformans are rarely produced by gonococcus infection.

**55. Polyvalent Antigen for Complement-Fixation Test.**—Hastings states that the technic of complement-fixation tests for infection with *Streptococcus viridans* is so laborious and difficult that the method will not be available for general clinical work.

### Journal of Outdoor Life, New York

*June, XI, No. 6, pp. 160-191*

57 Tuberculosis and Road to Eldorado. E. L. Trudeau, Saranac Lake.
58 Week from Diary of Lazy Man. C. R. Flannigan, Colorado Springs, Colo.
59 Exhibit that Really Exhibits. L. W. Hine, Saranac Lake.
60 Comparative Cost of Maintenance of Sanatoria and Hospitals for Tuberculous in United States. M. Collins, Denver.

*July, No. 7, pp. 192-223*

61 Hemorrhage in Tuberculosis. A. A. Pleyte, Wales, Wis.
62 Day and Night Camp "Rutherford." R. M. Mills, Brooklyn.
63 Putting Courage into Crusade. E. N. McCormack, Grand Rapids, Mich.
64 Incidence of Tuberculosis Among Physicians and Nurses. L. I. Dublin, New York.
65 Without Camp. H. Shigley, Colorado Springs, Colo.

### Kentucky Medical Journal, Bowling Green

*July, XII, No. 13, pp. 339-434*

66 Health Problems of Kentucky. D. P. Curry, St. Charles.
67 Tuberculosis. W. L. Heizer, Bowling Green.
68 Extra-Uterine Pregnancy. C. A. Fish, Frankfort.
69 Vaccine Treatment of Pertussis. J. A. Kirk, Louisville.
70 Uses of Roentgen Ray as Diagnostic Agent. J. B. Mason, London.
71 Appendicitis. J. H. Parker, Corbin.
72 Country Practitioner and Cut Fees. W. Pennington, Bertha.
73 Tumors of Breast. T. C. Nichols, Morgan.
74 Trachoma. R. I. Kerr, Belmont.
75 Case of Mercury Bichlorid Poisoning with Recovery. H. G. Herring, Lexington.
76 Pleurisy. H. T. Morris, Greenup.
77 Diagnosis of Pregnancy. A. E. Threlkeld, Wheatley.
78 Hookworm Arthritis. B. F. Van Meter, Lexington.

### Lancet-Clinic, Cincinnati

*July 4, CXII, No. 1, pp. 1-24*

79 Operations for Cure of Chronic Ear Suppuration. N. H. Pierce, Chicago.
80 Prolapse of Uterus and Its Treatment. A. D. Willmoth, Louisville, Ky.
81 Sex Problems. (To be continued.) I. O. Allen, Metamora, Ind.

*July 11, No. 2, pp. 25-60*

82 Treatment of Syphilis of Nervous System by Means of Salvarsanized Serum in Vivo: Ninety-One Injections in Twenty Cases. R. B. H. Gradwohl, St. Louis.
83 "Business" of Keeping Insane. Is There Better Way? B. Holmes, Chicago.

### Laryngoscope, St. Louis

*June, XXIV, No. 6, pp. 565-644*

84 Corrective Rhinoplasty. L. Cohen, Baltimore.
85 Histopathology of Faucial Tonsil. T. E. Carmody, Denver.
86 Treatment of Accidental Wounds of Dura During Operations on Mastoid Process. E. B. Dench, New York.
87 Anesthesia in Aural Surgery. W. G. Doran, New York.
88 Asepsis in Office Practice. C. G. Crane, Brooklyn.

### Medical Record, New York

*July 18, LXXXVI, No. 3, pp. 95-140*

89 Diagnosis and Treatment of Gastric and Duodenal Ulcers. M. Einhorn, New York.
90 Roentgen Rays and Radio-active Chemicals in Treatment of Gynecologic Conditions. E. H. Grubbé, Chicago.
91 *Treatment of Toxemia of Pregnancy of Duodenal Enema. E. McDonald, New York.
92 Value of Eugenics in Hunting's Chorea. C. R. McKinniss, Norristown, Pa.
93 Carbon Dioxid Bath and Its Uses. A. W. Ferris, Saratoga Springs.
94 General Diagnosis and Treatment of Diseases of Pancreas. I. W. Held, New York.

**91. Treatment of Toxemia of Pregnancy by Duodenal Enema.**—McDonald has treated twelve cases of toxic vomiting of pregnancy by means of a duodenal tube, which is a modification of the Jutte tube. The procedure is as follows: A small rubber tube about the caliber of 12 F, is thrust into the stomach after the pharynx has been anesthetized by a local anesthetic spray. Most patients are able to swallow the tube themselves after the first treatment, but at the first attempt, in order to maintain the patient's confidence, it is better to cocainize the throat and insert the tube with the patient sitting up in a chair. The tongue is depressed with the forefinger while the tube is thrust down with the other hand, the patient being advised to breathe deeply and slowly, in order to prevent any nausea. When the tube is down about 22 inches, 8 ounces of a solution of sodium chlorid in amount a trifle stronger than the physiologic solution, is injected by means of a syringe through the tube into the stomach. This usually effectually neutralizes the tendency to vomit. The tube is then thrust further down to about the length of 28 inches. The patient is then placed on her right side in a semiprone position. The waistbands are loosened. After a few minutes, suction is made by means of a vacuum bottle and syringe to withdraw some of the contents through the tube. When bile or intestinal juice is obtained, it is considered that the tip of the tube has passed the duodenum. The stomach should be empty for several hours before the treatment is given. It is usually possible to pass the pylorus within five to seven minutes.

An injection is then made by means of a gravity can of a liter of a solution containing from 4 to 6 gm., by measure, of granular sodium sulphite. This solution has the effect of precipitating itself through the intestines; within thirty minutes from the time the last of the sulphate solution is introduced into the tube the first of it appears at the anus. No patient has required more than a single treatment, as after the first general hygienic measures can be instituted, such as regulation of the bowels, drinking a large quantity of water, and a simple diet. Among the twelve cases no patient, save one, has had any vomiting after the treatment. In the beginning several patients had a number of treatments because McDonald did not believe it possible that one treatment would cure them.

### Military Surgeon, Chicago

*July, XXXV, No. 1, pp. 1-100*

95 Identification of Two Unknown Dead Soldiers by Finger Prints. A. W. Williams, U. S. Army.
96 Surgeon's Division in Naval Militia. How Can It Best Fit Itself and Men It Serves for Service of Nation in Time of War. M. W. Houghton, R. I. N. B.
97 Venereal Prophylaxis, from December, 1913, to April, 1914, at Fort Washington, Md., for Purpose of Showing Its Efficacy. M. Ashford, U. S. Army.
98 Medical Survey of Indian Village, Haines, Alaska. H. M. Craig and J. S. Lambie, U. S. Army.
99 Sanitary Officer in Field. F. Schavoir, Conn. N. G.

### Mississippi Medical Monthly, Vicksburg

*July, XIX, No. 3, pp. 45-64*

100 Clinical Significance of Ammoniacal Urine in Infants and Young Children. R. A. Strong, Pass Christian.

### New York Medical Journal

*July 18, C, No. 3, pp. 109-156*

101 Biochemical Function of Endometrium in Etiology of Metrorrhagia and Menorrhagia. J. R. Goffe, New York.
102 Mensuration and Projection of Posterior Urethra and Vesical Floor by Means of Posterior Urethral Calipers and Roentgenography. V. C. Pedersen and B. C. Darling, New York.
103 Prevention of Cancer. A. C. Wood, Philadelphia.
104 Instrument for Direct Application of Radium to Neoplasms of Bladder. W. Ayres, New York.
105 Valvular Disease in Infancy and Childhood. R. Abrahams, New York.
106 Three Cases of Acute, Double Optic Nerve Atrophy. H. F. Hansell, Philadelphia.
107 Bone Complications in Renal Tuberculosis. H. Neuhof, New York.
108 Alkaloids. A. C. Reed, Changsha, China.
109 Case of Purpura Hemorrhagica. Morbus maculosus, Werlhofi. G. Parker, Burin North, Newfoundland.

### Northwest Medicine, Seattle, Wash.

*July, VI, No. 7, pp. 189-220*

110 *Prevalence of Goiter in Northwest. D. C. Hall, Seattle.
111 Problems in Gastric Diagnosis. F. Eppler, Spokane.
112 Chronic Pyelitis. W. J. Pennock, Spokane.
113 *Twenty Cases of Renal Tuberculosis. A. H. Peacock, Seattle.
114 Kefir, Fermented Medicinal Milk. A. Tilzer, Portland, Ore.
115 Internal Secretion of Sexual Glands. C. E. Eaton, Seattle.

110. **Prevalence of Goiter.**—The series of students in the University of Washington examined by Hall consisted of 2,086 men with the average age of 20 years and 5 months, and 1,253 women with the average age of 19 years and 3 months. Of the 2,086 men, 374 were affected as follows: 272 classed as perceptible, or 13.03 per cent.; 92 classed as medium, or 4.43 per cent.; 10 classed as large, or 0.48 per cent. Of the 1,253 women, 388 were affected as follows: 294 classed as perceptible, or 23.45 per cent.; 85 classed as medium, or 6.79 per cent.; 9 classed as large, or 0.7 per cent. Of the nineteen classed as large, four had a marked exophthalmos, one man and three women. They were strikingly of the plethoric type, large, full-blooded and verging on the obese. But one, a girl, showed signs of a toxemia and that only on exertion or especially during excitement, at which time tachycardia sweating and tremor became apparent. The exophthalmos was such in two other cases, one man and one woman, that complete closure of the eyelids was impossible. The enlarged gland was symmetrical as a rule, but when asymmetrical the enlargement was always on the right side. Careful observation was made of the examinations of 582 men, of whom 96 had either a medium or perceptible enlargement. Of this number nine, or 9.4 per cent., were on the right side. It was attempted to determine the incidence of heredity, but this was unreliable. In a series of 343 women of whom 83 were affected, ten, or 2.9 per cent., gave a history of the malady in the family. The direct hereditary quality here is not such that much credence can be placed in it.

113. **Renal Tuberculosis.**—In summing up his study of twenty cases of renal tuberculosis, Peacock is impressed with several very clear conditions. First, the uniform consistency with which the tubercle bacilli were demonstrated in the urine, being found in all but one case. Second, hematuria that was noticed by the patient in 60 per cent. of the cases. It usually occurred early and was not associated with pain. Third, that sex makes little difference, nine cases being females and eleven males. Fourth, age at the time of consultation was 26 years, the youngest being 14 and the oldest 43. Fifth, 60 per cent. were demonstrated to be bilateral, that is, the tubercle bacillus was so found at the first catheterization. With such a finding there should be considerable hesitation before he resorts to nephrectomy. Again, we should remember the origin of renal tuberculous infections, and that if one organ has become involved it is reasonable to suppose that if the other one is not also infected, the possibility of breaking down later is great, as in cases 5 and 7. Sixth, in 65 per cent. of these cases were found other tuberculous lesions and it is safe to assume that the remaining ones there must have been tuberculous processes that escaped the physical examination.

**Philippine Journal of Science, Manila**

*February, IX, No. 1, pp. 1-133*

116 *Cockroaches and Ants as Carriers of Vibrios of Asiatic Cholera. M. A. Barber.

117 Reappearance of Plague in Philippines after an Absence of Six Years. V. G. Heiser.

118 *Experiments of Cultivation of Virus of Rinderpest in Vitro. W. H. Boynton.

119 Atypical Case of Rinderpest in Carabao. W. H. Boynton.

120 Experiments on Transmission of Rinderpest. A. R. Ward, F. W. Wood and W. H. Boynton.

121 *Intestinal Parasitism, Particularly Entamebiasis, in Patients of Philippine General Hospital, Manila. D. G. Willets.

122 *Treatment of Entamebiasis with Ipecac, Emetin and Neosalvarsan at Philippine General Hospital, Manila. D. G. Willets, C. R. Stanley and P. Gutierrez.

123 Nerve Degeneration in Fowls Fed on Unhusked Rice (Palay). R. B. Gibson and I. Concepcion.

124 Simultaneous Method of Inoculating Cattle and Carabaos with Serum from Animals that have Been Recently Immunized. A. R. Ward and F. W. Wood.

116. **Carriers of Asiatic Cholera.**—Barber found that cockroaches which have fed on human cholera feces may harbor cholera vibrios in their intestines, and these may appear in enormous numbers in the insects' feces for at least two days after the insects have fed, and may occur in smaller numbers seventy-nine hours after ingestion. By means of both feces and vomit, cockroaches may act as carriers of cholera to human food. Cholera vibrios in cockroach feces will survive on human food at least sixteen hours after discharge from the insect, and cholera vibrios in human feces will survive, in competition with numerous other bacteria, on food at least four days. There is no loss of virulence for guinea-pigs in cholera vibrios after twenty-nine hours in the intestine of the cockroach. Cholera vibrios may be found in the bodies of ants at least eight hours after they ingested cholera cultures or human feces from cholera patients.

118. **Cultivation of Virus of Rinderpest.**—The virus of rinderpest has been carried in virulent form by Boynton in two separate series up to the sixth transfer in glucose blood-culture media, covering periods of nineteen and twenty-one days, respectively. In one series the medium first inoculated was non-virulent at the end of twelve days, while the fourth transfer from this tube of culture medium after the same period of time was virulent. Results obtained from numerous experiments indicate that fresh blood from non-immune cattle as a main constituent and glucose as an addition are essential components of the culture media. The virus of rinderpest requires either partial or complete anaerobic conditions for its existence.

121. **Intestinal Parasitism.**—Entamebic infections were found by Willets in 37.5 per cent. of the 1,000 individuals examined, in 38.8 per cent. of 900 Filipinos, in 26.0 per cent. of 100 Americans; in 46.3 per cent. of 417 adult female Filipinos, in 34.2 per cent. of 383 adult male Filipinos, in 25.0 per cent. of 100 Filipino children, in 25.4 per cent. of 71 adult male Americans, and in 27.6 per cent. of 29 adult female Americans. Double infections were found in 59.2 per cent., pure *E. coli* infections in 35.5 per cent., pure *E. histolytica* infections in 5.3 per cent., *E. coli* infections in 94.7 per cent. and *E. histolytica* infections in 64.5 per cent. If more stools had been examined of each patient, it is believed that the positive percentage would have been about 55 instead of 37.5. Willets holds that diagnosis of entamebic infection should be made not only on the presence of active, but also on that of quiescent or encysted forms. The one safe stage of development for a differential diagnosis between *E. coli* and *E. histolytica* is the encysted form encountered in formed stools. Willets suggests that it is probable that in dysenteric stools active *E. coli* closely resembles active *E. histolytica* in motility and general appearance without a corresponding change in its nuclear structure.

122. **Treatment of Entamebiasis.**—The 132 cases of entamebiasis considered by Willets consist of 27 dysenteric and 105 non-dysenteric cases. The dysenteric cases are divided into 11 treated with emetine and 16 with ipecac; the non-dysenteric, into 44 controls—34 treated with ipecac, 19 with emetine, and 8 with neosalvarsan. Prophylaxis against the occurrence of entamebic dysentery in an infected individual and against carriers of *Enatameba histolytica* consists in (1) making a differential diagnosis between *E. coli* and *E. histloytica* and treating only those infected with the latter species or (2) treating all persons indiscriminately who are infected with entameba. Prophylactic treatment should be confined to expelling entameba from the intestinal tract. In order that such a treatment may be used widely, it must be inexpensive, give good results quickly, and the method of administration must be simple and unattended by prolonged unpleasant reaction.

Four preparations are now in use for entamebiasis—ipecac, emetine, neosalvarsan and bismuth. Results obtained in non-dysenteric entamebiasis with salvarsan and with neosalvarsan indicate that this treatment may prove to be the most efficacious in quickly relieving the dysenteric symptoms and expelling entameba from the intestinal tract. More than three consecutive negative examinations are required before one may state with safety that a person is free from entameba, provided four cover-glass preparations be examined of each specimen. Rest and diet influence the clinical evidences of entamebic dysentery favorably, and Willets' results in control cases tend to show that they are to be reckoned with in the elimination of entameba from the

intestinal tract. In dysenteric cases emetine gave a larger percentage of symptomatic cures and acted quicker in this class of cases than ipecac. Emetine and ipecac were about equally efficacious in expelling entameba from the intestinal tract. The time required to expel the entameba with the two preparations was also about equal.

In non-dysenteric cases neosalvarsan freed the bowel of entameba in 100 per cent. of cases, ipecac in 70.6 per cent., and emetine in 36.8 per cent. From the last two percentages an undetermined factor which is less than 25 per cent. must be subtracted, because this percentage of cases would have given 2 consecutive final negative examinations (an arbitary standard adopted for comparative purposes) in the time limits without treatment.

### South Carolina Medical Association Journal, Seneca

*June, X, No. 6, pp. 344-374*

125 Certain Medical Aspects of Alien Race Problem. C. W. Stiles, Washington, D. C.
126 Successful Treatment of Autotoxemia and Lesions of Large Bowel, Including Appendix. F. Moore, Montmorenci, S. C.
127 Diagnosis and Treatment of Diarrhea. G. M. Niles, Atlanta, Ga.

### Southern Medical Journal, Nashville, Tenn.

*July, VII, No. 7, pp. 519-596*

128 *Etiology of Pellagra: Experimental Inoculation of Monkeys and Rabbits. W. A. Dearman, Long Beach, Miss.
129 *Digestive Symptoms of Pellagra. S. Harris, Mobile, Ala.
130 First (?) Symptom in Pellagra. T. Frazer, Asheville, N. C.
131 Cerebrospinal Meningitis. R. Lyons, New Orleans.
132 *Subcutaneous Medication in Anemias. M. K. Robbie, San Antonio, Tex.
133 Case of Multiple Mycotic Aneurysm of Aorta. H. L. McNeil, Houston, Tex.
134 Treatment of Fractures of Femur with Hodgen's Splint. W. M. McCabe and J. F. Gallagher, Nashville.
135 Lesions of Sacro-Iliac Joint. J. P. Chapman, Mobile, Ala.
136 Tumors of Carotid Gland. J. Funke, Atlanta, Ga.
137 Postoperative Complications of Abdominal Section and Their Treatment. R. Wallace, Chattanooga.
138 Rarity of Certain Variety of Persistent Hyaloid Artery. Report of Case. R. M. Nelson, Atlanta, Ga.
139 Cataracta Complicta Similar to Senile Cortical Cataracts. A. B. Mason, Waycross, Ga.
140 Typhus Fever: Report of Four Cases. L. B. Newell and W. Allan, Charlotte, N. C.
141 Practical Sanitation for Small Cities and Towns. R. L. Robertson, Charlottesville, Va.
142 Alcoholism and Drug Addictions among Physicians in Alabama. W. D. Partlow, Tuscaloosa, Ala.
143 Treatment of Pus Appendix. G. H. Bunch, Columbia, S. C.
144 Field of Neurologic Surgery and Its Relation to Other Branches. C. M. Remsen, Atlanta, Ga.
145 Plea against Still Too Frequent Sacrifice of Turbinates. R. W. Bledsoe, Covington, Ky.
146 Broncho-Esophagoscopy. E. W. Carpenter, Greenville, S. C.

**128. Etiology of Pellagra.**—Samples of cornmeal were obtained by Dearman from pellagrous homes and from local dealers. Moulds were cultivated, isolated aerobically and anaerobically, suspended in physiologic salt solution, and experimentally injected and fed to rabbits, chickens, pigs and monkeys. Neither ever developed any lesions resembling pellagra. He believes that pellagra is an insect-borne disease, and that dog and cat fleas should be looked on with suspicion, not to the exclusion of other possible transmitters.

**129. Digestive Symptoms of Pellagra.**—In beginning the treatment of pellagra, Harris usually gives several small doses of calomel, 1/20 grain every hour until ¼ grain is given, then bismuth subnitrate in from ½ to 1 dram doses, with 5 grains of salol every two to four hours as may be necessary to control diarrhea. He has rarely found it necessary to use opium. Where there is absence or deficiency of hydrochloric acid, dilute hydrochloric acid with pepsin often relieves the gastric symptoms and will not infrequently control diarrhea. Colonic irrigations with normal salt solution are often helpful, and, in some cases, in which there is pain in the rectum, anodyne suppositories give great relief. When there is stomatitis with ptyalism the chlorate of potash given internally yields splendid results. Mild antiseptic mouth washes, as diluted liquor antisepticus alkalinus are helpful. Fowler's solution should be given in ascending doses of from 1 to 15, or even 20 drops three times a day, or until the physiologic effects are obtained. Harris has used atoxyl in a number of cases but has not been pleased with the results. He is inclined to think that the arsenic must be taken into the alimentary canal to get the beneficial results.

**132. Subcutaneous Medication in Anemias.**—Robbie's experience in subcutaneous and intramuscular medication has been principally and chiefly in the anemias of malaria and those resulting from gastro-intestinal disturbances. The preparation Robbie has been using is 5 to 6 grains of citrate of iron, 1 to 6 grains sodium arsenate and 1 to 120 grains of strychnin sulphate put up in small sterile ampules and given once or twice daily as the case required.

## FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

### British Medical Journal, London

*July 4, II, No. 2792, pp. 1-52*

1 British Medical Association in Australia. J. A. MacDonald.
2 Three Cases of Fracture in Neighborhood of Joints Treated by Plating. G. H. Colt.
3 *Hemostasis by Application of Living Tissue. V. Horsley.
4 New and Economical Method of Radium Therapy by Means of Emanation Needles. W. C. Stevenson.
5 Roentgen-Ray Treatment of Tuberculous Glands. H. Mowat.
6 Suspected Case of Foot and Mouth Disease in Man. V. Whitby.
7 *Clinical Test for Estimation of Percentage of Glucose. G. C. Parnell.
8 Case of Cyclopia. D. Dougal and T. M. Bride.
9 Case of Left Duodenal Hernia in Child. F. C. Pybus.
10 Reduction of Old Elbow Dislocation by Operation. F. D. Bird.
11 Napthalene for Destruction of Mosquitoes in Covered Cisterns and Wells. A. W. Bacot.

**3. Hemostasis by Application of Living Tissue.**—To stop bleeding and hemorrhage oozing from soft tissues other than by the employment of a ligature, or pressure with a guaze tampon, or by irrigation with hot liquid, Horsley uses living vascular tissue—that obtained from the (injured) surface of a cut fragment of muscle. If the bleeding point—for example, from the cut surface of the brain, liver, or any soft tissue—be gently pressed with gauze, and this instantly replaced by a piece of living muscle, and pressure again applied from fifteen to twenty seconds, it will be found that the muscle fragment closely adheres to the tissue it is applied to. Such adhesion is necessarily limited by the pressure at which the blood is escaping from the bleeding point.

By direct experiment on divided arteries (including the aorta) in the cat and dog, Horsley found that a muscle hemostasis would resist as much as 60 to 80 mm. Hg blood-pressure. Further histologic investigation of the exceedingly thin viscous layer occupying the plane of contact of the two masses of tissue shows that it contains blood-platelets, fibrin, fibrils, etc., in a considerable degree, and within a short time (five to ten minutes) of commencing the preparation. To estimate the degree of active thrombokinesis Horsley also tested the utility of the muscle after it had been boiled for five minutes at 100 C. Such boiled tissue had a very poor hemostatic effect. It seemed as if this was partly owing to the great loss of adhesiveness which is caused by the heat coagulation completely altering the physical surface of the muscle tissue. Of other tissues Horsely has only exhaustively tried fascia, and with the result that it has not proved satisfactory. It has not the factor of adhesiveness sufficiently well marked, though it can be employed when it is not convenient to take a piece of muscle.

**7. Estimation of Percentage of Glucose in Urine.**—Parnell demonstrated that with Moore's test the colors resulting from boiling equal parts of diabetic urine with liquor potassae do vary in direct proportion to the amount of glucose that exists in samples under examination. To obtain accurate results the amount of diabetic urine or manufactured solutions must be boiled with equal parts of liquor potassae; there must be no guess-work. Each sample must be boiled thoroughly. The test-tubes should not be larger or smaller than five-eighths to six-eighths of an inch in diameter, and the liquor potassæ should be fresh. The resultant color when

found to correspond with any of the test-glasses, will give the percentage, the grains per ounce, or the parts per 1,000, multiplied by 2. Parnell uses for estimation colored glasses showing the exact shades of the different solutions containing known amounts of glucose. On each glass, the size of a microscopic slide, is marked the percentage, the number of grains per ounce, and the number of parts per 1,000.

### Edinburgh Medical Journal

*July, XIII, No. 1, pp. 1-96*

12 Empyema in Children. H. G. M. Dunlop.
13 New Route of Inquiry as to Nature and Establishment of Typical Sex-Ensemble in Mammalia. (To be continued.) D. B. Hart.
14 Anaphylaxis and Status Lymphaticus: Their Relation to Intensified Types of Disease in Infancy and Childhood. (To be continued.) C. M'Neil.
15 *Recurrent Luxation of Patella. D. M. Greig.
16 Dr. Thomas Spens: First Describer of Stokes-Adams' Syndrome. C. E. Lea.
17 Case of Chronic Primary Pneumococcal Cerebrospinal Meningitis. C. Kerr.

15. **Recurrent Luxation of Patella.**—In the treatment of recurrent luxation of the patella, confinement to bed and the application of splints are held by Greig to be unnecessary. He believes there is no actual surgical interference which will improve the condition unless such an obvious abnormality as knock-knee demands rectification. As long as violent games are avoided, he says, the recurrence of the dislocation may be prevented by the application of a firm and well-fitting leather knee-cap. The ordinary elastic knee-cap is neither adequate nor desirable, for its tightness is apt to bring about by pressure an atrophy of the underlying soft parts and interference with the circulation in the cutaneous veins. A soft leather knee-cap lacing up the side and with a hole for the patella is the cheapest in the long run and quite efficient.

### Glasgow Medical Journal

*July, LXXXII, No. 1, pp. 1-79*

18 Working of Midwives Act (England, 1902). F. H. Champneys.
19 Operative Treatment of Fractures, with Special Reference to Plating. G. H. Edington.
20 Acute Suppurative Appendicitis: Analysis of One Hundred Consecutive Cases. R. B. Carslaw.

### Lancet, London

*July 4, II, No. 4740, pp. 1-74*

21 Hygienic Aspect of Coal-Mining Industry in United Kingdom. F. Shufflebotham.
22 *One Thousand Consecutive Abdominal Operations. A. E. Giles.
23 Diseases of Pituitary Gland and Their Effect on Shape of Sella Turcica. E. G. Fearnsides.
24 Case of Triplets Successfully Breast-Fed. J. Morrison.
25 Pathologic Investigation of Four Cases of Pituitary Tumor. W. Johnson.
26 Removal of Foreign Body from Larynx by Suspension of Laryngoscopy. D. McKenzie.
27 Milk and Dairies Bill and Bacteriologic Examination of Milk. R. T. Hewlett.

22. **One Thousand Consecutive Operations.**—The table of cases cited by Giles shows that there was a marked drop in the mortality of the last 500 as compared with the first 500, the percentage being 3.4 in the later series and 5.2 in the earlier. The improvement is attributed to: 1. The personal factor of experience. 2. A higher standard of asepsis. 3. Improved technic. Ovariotomy.—165 cases, 6 deaths, mortality 3.6 per cent. Every kind of ovarian tumor was met with in these cases: multilocular cystic adenoma; papilloma; dermoid, unilateral and bilateral, and including some of the relatively rare cases of dermoid contents in multilocular tumors; parovarian cyst; blood-cyst (lutein hematoma); fibroma; carcinoma, and sarcoma. There were a good many cases with acute symptoms due to twisted pedicle, and several with rupture of the cyst. Tubal inflammatory disease, 154 cases, 12 deaths; extra-uterine pregnancy, 65 cases, 1 death; hysterectomy for fibroids, 208 cases, 7 deaths; hysterectomy for carcinoma, 37 cases, 1 death; myomectomy, 30 cases, no death; hysteropexy, 222 cases, 30 deaths; non-gynecologic operations, 119 cases, 13 deaths.

Speaking of drainage, Giles says that generally drainage should be avoided, if possible, but in certain cases it is essential, and because the danger in this respect of leaving undone the things that ought to be done is greater than that of doing the things that ought to be done he would say, "When in doubt, drain." The cases in which he drains are those with a considerable tendency to oozing from adhesion sites; cases in which the peritoneal cavity has been soiled with pus from the rupture of pus-tubes or the presence of an appendix or other abscess in the peritoneal cavity; cases of peritonitis without actual pus formation, when he is doubtful about the degree of virulence of the infection; and cases in which the bowel walls have been much damaged in the process of separating adhesions.

### Practitioner, London

*July, XCIII, No. 1, pp. 1-156*

28 Diagnosis and Treatment of Tropical Hepatic Abscess. D. Duckworth.
29 Necessity for Systematic and Complete Examination of Nervous System in Medicolegal Cases. J. Collie.
30 Traumatic Neurosis. J. W. G. Grant.
31 Pyrexia of Obscure Origin. G. N. Pitt.
32 Plea for More Systematic Employment of Treatment by Suggestion. M. Telling.
33 Use of Therapeutic Suggestion. R. G. M. Ladell.
34 Psycho-Analysis. C. E. Long.
35 Cases of Obstetric Interest. S. Sheill.
36 Occurrence of Pellagra in England. R. W. Willcocks.
37 Experiments in Connection with Orthostatic Albuminuria. F. D. Nicholson.
38 Work on Children's Diseases. H. Thursfield.
39 Difficulties in Tuberculin Administration. A. H. G. Burton.
40 Two Cases of Schlatter's Sprain. R. Connell.

### Quarterly Journal of Medicine, London

*July, VII, No. 28, pp. 325-495*

41 *Aggressins in Appendicitis and Some Other Varieties of Peritonitis. A. D. Gardner.
42 *Leukemias: An Analysis of Fifty-Nine Consecutive Cases. P. N. Panton, H. L. Tidy and G. H. Pearson.
43 *Fragility of Red Blood-Corpuscles in Physiologic and Pathologic States. A. D. Bigland.
44 *Case of Very Prolonged Cheyne-Stokes Breathing. W. H. White, J. H. Ryffel, E. P. Poulton, W. Johnson and R. A. Chisolm.
45 Importance of Functional Activity in Etiology of Nervous Diseases. W. Johnson.
46 Blood-Pressure Estimations in Disease by Oscillatory and Auditory Methods. G. S. Melvin and J. R. Murray.
47 Formation of B-Iminazolylethylamine in Ileum of Certain Constipated Subjects. N. Mutch.
48 Family Cerebral Degeneration with Macular Change (So-Called Juvenile Form of Family Amaurotic Idiocy). F. E. Batten.
49 Diagnosis of Pancreatic Disease. A. F. S. Sladden.

41. **Aggressins in Appendicitis and Peritonitis.**—The study of aggressins in the peritoneum leads Gardner to the conclusion that in the treatment of several varieties of peritonitis, closer attention might with advantage be paid to the question of bacterial multiplication, and to the direct means which are open to the surgeon of checking it. A considerable number of peritoneal exudates were tested for aggressive action (inhibition of phagocytosis *in vitro*). Gardner believes that aggressiveness is the direct consequence of a profuse multiplication of bacteria. The greater the number of bacteria, the more likely is the fluid to act aggressively. Early exudates therefore (first twenty-four hours) are never aggressive. Aggressive substances are nearly always present in pus from appendicular abscesses, and they do no harm so long as the abscess wall remains intact. But they may play an important and dangerous part when a channel of communication is formed between the abscess cavity and the general peritoneum. In spreading or already diffuse peritonitis, the formation of aggressive bodies, signifying as it does great bacterial activity, marks the onset of a graver stage of the infection. A consideration of aggressins, their origin and their action, suggests that a discriminating use of bactericidal chemicals may be of great value in the surgical treatment of peritonitis. In ether and colloidal silver Gardner has two such bodies which have undergone a successful trial.

42. **Leukemias.**—Of 59 consecutive cases of leukemia examined by the authors, 16 have been classed as acute myeloid, 29 as chronic myeloid, 8 as acute lymphoid leukemia, and 6 as chronic lymphoid. They state that it is

evident that the clinical picture of leukemia varies with the acuteness of chronicity of the disease, and not with the lymphoid or myeloid origin of the cells. Acute lymphoid and acute myeloid leukemia are clinically indistinguishable, and so may be chronic lymphoid and chronic myeloid leukemia. Acute lymphoid leukemia has little resemblance to chronic lymphoid, nor acute myeloid to chronic myeloid, except in so far as chronic myeloid may terminate by a condition similar to the acute disease. It is impossible to distinguish by a blood examination between the acute and chronic types of myeloid leukemia, but not between acute and chronic lymphoid leukemia. The latter diseases are readily distinguished on clinical grounds. Acute myeloid and acute lymphoid leukemia can be distinguished by the type of cell present, but the conditions have been frequently confused and the clinical course is the same. The confusion has been due to a failure in distinguishing between myeloblasts and lymphocytes. The differentiation is rarely if ever difficult for those accustomed to the use of Leishman's or other similar stains. In this connection they have found the oxydase reaction to be quite useless. In no case in the authors' experience has the myeloid type of cell been replaced by the lymphoid type, or vice versa.

The effect of treatment in the acute cases has been negligible. In the chronic lymphoid cases, changes have been extremely slight. In the chronic myeloid cases, some have changed little, others have changed to a remarkable degree. Those cases which have fluctuated to the greatest extent have been the youngest subjects. The blood of patients over the middle age reacts but little. There has been no instance of purpura in either of the chronic leukemias. In those cases of acute leukemia associated with purpura the spleen was invariably enlarged. Infiltrations of the skin, painful bones, and priapism occurred in no case. Oral sepsis did not appear to have any bearing on any type of the disease.

The cases of acute myeloid leukemia include an interesting group of four patients whose predominant blood-cell was a so-called Rieder cell. This cell the authors believe to be a large hyaline, partly on morphologic grounds since the cell may be indistinguishable from the large hyaline of normal blood, and intermediate types between the normal cell and the primitive marrow-cell were numerous; partly on functional grounds, because these cells were actively phagocytic as are those of the normal blood. They consider that a scrutiny of these cases affords strong evidence of the marrow origin of the large hyaline cell.

43. **Fragility of Red Blood-Corpuscles.**—The following method for estimating the fragility of the red blood-corpuscles was advised by Bigland and has worked very successfully. A saponin solution of 1 in 1,000 strength was made up with normal saline solution; this was kept as stock and renewed on one occasion during the work. For use, 5 c.c. of this saponin solution were diluted with 45 c.c. of saline and placed in a burette. Thus the strength of saponin actually used was 1 in 10,000 dilution. A few drops of blood were allowed to flow from a needle prick into tubes containing normal saline mixed with sufficient quantity of a citrate to prevent clotting and maintain the correct tonicity of the solution. This suspension of red blood-corpuscles was then centrifugalized for ten minutes and the supernatant fluid poured away, the resulting corpuscles being regarded as "washed."

When the patient's corpuscles in contact with the serum were examined the blood was drawn up into Zeiss white corpuscle counting pipet (up to the second division on the tube) and the contents transferred to small tubes (those used in the final experiment) filled with an amount of saline solution such that when the saponin solution is added later on the total bulk will be 3 c.c. When the patient's serum alone was required, free from red blood-corpuscles, the blood was collected in Wassermann tubes. These were centrifugalized, then placed in an incubator at 37 C. for half an hour to shrink the clot, and then were centrifugalized again. The resulting serum was drawn off by a similar Zeiss pipet, only this time up to division 1 on the scale.

One to 2 c.c. of saponin is regarded as the standard, and therefore the tubes containing the abnormal red blood-corpuscles to be tested will also have 1-2 c.c. of saponin added to them. The reason for fixing this standard at 1-2 c.c. of saponin is solely for the sake of convenience; normal corpuscles laking with this amount of saponin in about four minutes. Bigland found that human red blood-corpuscles show a constant figure of resistance toward saponin hemolysis. The serum is markedly protective against the action of saponin, but this power varies within certain limits. The corpuscles of various animals show marked variation in their fragility.

In jaundice the resistance of the washed red blood-corpuscles is markedly diminished, while the protective action of the serum is markedly increased. This latter result is not due only to the antagonistic action of saponin and bile salts. In all the anemias, except pernicious anemia, the corpuscular resistance is increased. In pernicious anemia it is normal or slightly diminished. In splenic anemia there is great increase in corpuscular resistance, and the serum appears to have no protective reaction. In the anemia found in malignant disease, syphilis, tuberculosis, scurvy, amyloid disease, and myelogenous leukemia, and in a case of splenectomy there was an increased corpuscular resistance. In diabetes the corpuscular fragility is normal, while the serum in some cases is abnormally protective. In exophthalmic goiter and paroxysmal hemoglobinuria the corpuscular fragility is normal. In polycythemia the resistance is increased. A high temperature appears to increase corpuscular fragility.

44. **Case of Prolonged Cheyne-Stokes Breathing.**—In the case cited Cheyne-Stokes breathing lasted certainly six months, and from the account given by the patient's wife possibly for very much longer. It was present during both sleeping and waking. Although the patient was, as shown by the condition of the retina, the hypertrophy of the heart, and the high blood-pressure, an example of arteriosclerosis, yet the post-mortem examination disclosed that the arterial change was not extensive, for the arteries in the brain were normal, as were many of those in the kidneys, and these organs were not advanced beyond an early granular change. The composition of the alveolar air was determined on several occasions, and it was possible to confirm the findings of previous observers. Observations on the blood dissociation curve by Barcoft's method showed that the blood was abnormally acid, and the authors obtained proof that the respiratory center suffered from diminished excitability. Analysis of the urine and blood proved that lactic acid was not the cause of the increased acidity of the blood. Histologic examination of the respiratory center showed changes similar to those already described by previous observers, although it was impossible to say whether they were the result or partly the cause of the Cheyne-Stokes breathing.

## Archives des Mal. de l'App. Digestif, Paris

*May, VIII, No. 5, pp. 241-300*

50 Pyloric Stenosis with Hypertrophy in Man of 58. H. Hartmann.
51 *Retention of Salt and Elimination of Excess in Gastric Juice. (Les hyperchlorhydries éliminatrices.) H. Surmont and M. Dehon.
52 *Anachlorhydria with Gall-Stones; Twelve Cases. T. Hernando.
53 Dialysis Test of Stomach Content. (Les matières dialysables du contenu stomacal décelables par la réaction de la ninhydrin.) Wasserthal.

51. **Vicarious Hyperchlorhydria.**—Surmont and Dehon think that defective elimination of salt by the kidneys is often compensated for by hyperchlorhydria, the true cause of which, the defective functioning of the kidneys, may escape detection. They report six typical cases, calling attention to the return to normal in the stomach conditions as soon as the kidneys began to do their work properly. This eliminating or vicarious hyperchlorhydria may be the very first sign of latent cardiorenal mischief. The acidity may become so extreme as to entail erosions and ulceration.

52. **Gastric Hypo-Acidity and Gall-Stone Disease.**—Hernando reports twelve cases in which gastric secretion reached

its lowest ebb in connection with cholelithiasis. The anachlorhydria may be either primary or secondary or both. In one case the anacidity long preceded the gall-stone trouble and possibly may have been a causal factor in the latter. His experience with drugs to supply to some extent the lacking gastric acid confirmed the connection between the stomach and bile apparatus trouble, as some of the symptoms of the latter showed marked improvement as conditions became more normal in the digestive tract.

### Archives de Médecine des Enfants, Paris

*May, XVII, No. 5, pp. 321-400*

54 Sugar in Large Doses in Treatment of Incessant Vomiting in Infants and of Athrepsia. P. Nobécourt.
55 Teething. (La dentition chez les enfants.) J. Comby.
56 Spasmodic Contraction of the Scapular Muscles. (Attitude vicieuse de l'omoplate.) M. N. Wilbouchewitch.
57 Generalized Gonorrhea in Girl of 2½; Recovery under Immobilization of Joints. H. Schwers.
58 Cerebellar Ataxia in Children. J. Comby and A. D'Espine.

### Journal de Chirurgie, Paris

*June, XII, No. 6, pp. 689-854*

59 *Operative Treatment of Echinococcus Disease of the Liver Perforating into the Bile Passages. (Kystes hydatiques du foie.) P. Lecène and H. Mondor.
60 *Technic for Resection of the Colon. (Colectomie totale et colectomie sous-cecale.) G. Lardennois.

59. **Perforation of Echinococcus Cyst into Bile Passages.**—Lecène and Mondor relate a case of this kind in a young man. The first signs of trouble two years before were diagnosed as typhoid at the time. Eight and fourteen months later he had attacks of pain diagnosed and treated as gall-stone colic. Then fever and jaundice developed and the stools became clay-colored, with other symptoms indicating mischief in the bile ducts. The operation revealed a large echinococcus cyst in the liver with an opening into the common bile duct. They have found 30 analogous operative cases on record, the various conditions encountered requiring seven different technics. The mortality was about 33 per cent.; success depends on the possibility of thorough draining of the bile duct involved.

60. **Resection of the Colon.**—Lardennois gives an illustrated description of a technic which he thinks is superior to Lane's method of short-circuiting in that it takes better account of the special anatomy of the region; does not sacrifice the greater omentum; and the pelvis is raised while the intestine is being cut and reunited, but the chief advantage of his technic is in the preservation of the cecum, the operation being a subcecal colectomy with anastomosis between the cecum and the sigmoid flexure. By thus saving part of the cecum we avoid the pains of the period during which the small intestine is adapting itself to the new conditions.

### Lyon Médical

*XLVI, Nos. 25-26, pp. 1369-1512*

61 The Doctor's Wife. (La femme du médecin.) Aubert.
62 Dietary Deficiency Diseases in Pigeons. (Les maladies alimentaires par "carence.") E. Weill and G. Mouriquand.

### Presse Médicale, Paris

*May 6, XXII, No. 36, pp. 341-348*

63 How to Administer Digitalis. A. Martinet.
64 *Injection of Serum into Perineum Liable to Cure Enuresis. Cahier.

64. **Serotherapy for Nocturnal Enuresis.**—Cahier makes a subcutaneous injection of physiologic salt solution directly into the perineum, each side of the raphe. The fluid must be forced in rapidly, the aim being to act on the nerve terminals in the region by pressure from the huge blister thus formed. For adults he injects from 80 to 100 c.c. on each side. He has been applying this measure—which, he remarks, is comparatively simple and entirely harmless—since 1906 and has now a record of 30 cases, with a complete cure of the annoying night enuresis in 18 after a single injection. In 6 cases a second or third injection was required, and in 6 others no benefit was realized. The patient is awakened at night by the desire to urinate, and is thus able to control the process where before it proceeded automatically without awakening him. Cahier cites a number of other army doctors who have had gratifying results with this method in a very large proportion of their cases. Gauléjac has reported 50 per cent. cured in 150 cases in children; he restricts the amount of fluid to 40 or 60 c.c. so as not to stretch the child's skin unduly.

### Revue de Médecine, Paris

*June, XXXIV, No. 6, pp. 393-472*

65 Measurement of the Pressure of the Cerebrospinal Fluid. (Manométrie clinique.) H. Claude, R. Porak and J. Rouillard.
66 Diagnosis of Cancer, etc., from Cells Found in Stomach Content. (Le cyto-diagnostic des liquides gastriques.) L. Caussade.
67 Glycosuria Induced in Dog by Intravenous Injection of Cerebrospinal Fluid from Acromegaly Patient. L. Lévy and R. Bouhd.

### Semaine Médicale, Paris

*July 1, XXXIV, No. 26, pp. 301-312*

68 *Retention of Different Elements of the Bile. (Les retentions biliaires par lésion de la cellule hepatique.) A. Lemierre, M. Brulé and H. Garban.

68. **Retention of Bile from Functional Incapacity of the Liver.**—This article is practically a summary and continuation of the article reviewed in these columns July 25, p. 356. The writers comment on the fact that three different scientists by different technics arrived almost simultaneously at the same conclusion in regard to the retention of different elements of the bile, namely, that only the liver cell itself is capable of discriminating in this way. Mechanical retention of bile is always of the whole bile. The positive findings of dissociated retention were always in affections known to have an injurious influence on the liver, especially typhoid, pneumonia, septicemia of different origins, tuberculosis and appendicitis, lead poisoning, alcoholism, pregnancy, heart disease, and after general anesthesia, particularly with chloroform.

### Archiv für Kinderheilkunde, Stuttgart

*LXIII, Nos. 1-2, pp. 1-160. Last Indexed July 25, p. 357*

69 *Cyclic Vomiting in Children and Its Causes. (Mit Acetonurie einhergehende periodische Erbrechen im Kindesalter.) H. Zade.
70 Albumin Milk in Infant Feeding. (Erfahrungen über die nach Verfahren von Engel hergestellte Eiweissmilch.) B. Leichtentritt.

69. **Cyclic Vomiting in Children.**—Zade presents arguments to show that the cyclic vomiting is the result of a sudden psychogenic upset of carbohydrate metabolism plus irritation of the vomiting center. The primal cause is, he assumes, of mental or emotional nature, and it is able to produce this effect only at certain periods. As the primal irritation subsides, the disturbances right themselves at once. Cases are known in which sudden fright has brought on severe diabetes, fatal coma following close on the suddenly appearing glycosuria. He has had a case of this kind, a healthy man barely escaping with his life in an accident, and dying in coma within a few months. Zade thinks that cyclic vomiting is a somewhat similar phenomenon. A psychogenic origin alone explains the sudden onset and the equally abrupt termination of the attack, the absence of nausea, the lack of influence from drugs and dieting, the odor of actone in the breath before the attack is actually installed and the cerebral nature of the vomiting act, so unmistakably a reflex process from excitation of the vomiting center. The result is—on a small scale—an acidosis like that of diabetes, and treatment should be with an alkali and sugar or sweet fruit juice, the same as for impending diabetic coma. These generally suffice as the trouble, he says, seems to be more a relative acidosis than alkali starvation. Saline infusion and warm baths may prove soothing and counteract the excessive loss of fluids in the vomiting.

He reviews the literature and reports in detail a case from his own practice in a boy 5½, well nourished, but with an inherited nervous taint and the exudative diathesis. The periodicity is best explained by Fliess' theory of periodic days. Of course cyclic vomiting may be associated with appendicitis or digestive disturbances, etc. The clinical picture of acetone vomiting may also be induced by such, and cease when they are cured, but these cases are not the true

cyclic vomiting which occurs—he remarks parenthetically—only during the years when the thymus is at its prime. No case is known after the age of 13. In the personal case reported what seemed to be an impending attack was warded off by having the child drink half a glass of water containing sugar and 5 gm. of sodium bicarbonate repeated the next evening.

### Berliner klinische Wochenschrift, Berlin

*June 29, LI, No. 266, p. 1205-1252*

71 *Laminectomy for Spondylitic Paralysis. A. Tietze.
72 Brace Cures Snapping Hip Joint. (Zur Therapie der schnappenden Hüfte.) G. Müller.
73 Transmission of Hodgkin's Disease to Guinea-Pigs. (Uebertragung von Lymphogranulomatosis auf Meerschweinchen.) E. Schaeffer.
74 Organotherapy with Alkaloids from Ductless Glands. C. W. Rose.
75 *Dulness over the Sound Apex in Children. (Die Spitzendämpfung im Kindesalter.) F. Mielke.
76 Refusal to Permit Operation in Its Bearing on Workmen's Compensation and Personal-Injury Suits. (Zur Frage der Ablehnung des Schadenersatzes wegen Verweigerung von Operationen.) H. Lieske.

**71. Laminectomy for Spondylitic Paralysis.**—Tietze reports fourteen cases of paralysis from compression of the spinal cord by diseased vertebrae in which he sought to remedy conditions by operative measures when the paralysis passed from the spastic into the flaccid form, showing the progressive nature of the lesion, after failure of extension treatment. Success can be anticipated usually only when the anatomic findings indicate compression from displacement of bones rather than from inflammatory granulations. He says that at first he made the mistake of trying to do too much and tamponing. The outcome was much better when he restricted his intervention to removing the arches, the perimeningitic granulations at the rear, and, when readily accessible, also at the sides, but refraining from working too far forward. In two cases he found relics of old neuritis in the roots and there was much pain. Marked benefit was realized only in 3 cases. One was a boy of 9, the others were young men with extensive kyphoscoliosis of a tuberculous nature. Marked improvement slowly followed extensive laminectomy. Five of the patients died from the operation and the others in the course of the following two years, the majority surviving about six months. At first there was considerable improvement but it did not last.

**75. Dulness over the Apex in Children.**—Mielke has found that a pathologic dulness over the apex is often simulated by conditions resulting from weakness of muscles which prevents the child from holding himself normally. As this condition is usually accompanied by pallor and lassitude, tuberculosis is incriminated. The evidence against this includes the shifting of the dulness to the other apex as the child sits or stands. He is convinced that in many cases of supposed tuberculosis the alleged signs are in reality merely the effect of the way the child stands. He encountered eighteen such cases during a recent four-month period. All treatment tending to strengthen the muscles aids in throwing off this anomaly.

He differentiates it by examining in various positions, especially when the child relaxes all its muscles. This is best realized by having the child stoop forward a little, its arms hanging loose, the abdomen drawn in. Of course it has long been known that scoliosis may induce dulness over the apex but Mielke thinks that no one has appreciated hitherto the importance in this line of even a very slight tendency to an asymmetrical attitude.

### Deutsches Archiv für Klinische Medizin, Leipzig

*CXV, Nos. 3 and 4, pp. 207-398. Last indexed July 25*

77 Vasoconstricting and Vasodilating Substances in the Blood. Experiments on the Isolated Heart. H. Hermel.
78 Kidney Disease with Salt Retention. P. v. Monakow.
79 Experimental Study of the Physiology and Pathology of Cholesterin Metabolism, Especially in Pregnancy. K. Havero.
80 Diagnosis of Adherent Pericardium. (Herzbeutelverwachsungen.) E. Edens and W. v. Forster.
81 Chloroma a Myeloblastic Tumor. (Chlorom und seine Beziehungen zur Myeloblastinleukämie.) K. Emden.
82 Refraction Index of Blood Sera and Transudates. J. Löwy.
83 Morphology of Renal Secretion and Absorption. M. Landau.
84 Permanently Irregular Pulse: Pathologic Anatomy. A. Jarisch.
85 Purin Enzymes in the Lung in Pneumonia. E. R. Long and H. G. Wells (Chicago).
86 Uric-Acid Content of the Blood in Diagnosis. R. A. Kocher.

### Deutsche medizinische Wochenschrift, Berlin

*July 2, XL, No. 27, pp. 1353-1408*

87 *Obstetric Hemorrhage. (Behandlung bedrohlicher Blutungen nach der Geburt.) P. Jung.
88 Recurrence of Experimental Trypanosomiasis. H. Ritz.
89 *Hyperglycemia in Elderly Diabetics. (Die Erhöhung des Blutzuckers bei greisen Zuckerkranken.) F. Hirschfeld.
90 Relations between the Spleen and the Liver Stellate Cells. (Experimentelle Untersuchungen über das "Milzgewebe" in der Leber.) G. Lepehne.
91 Direct Laryngoscopy and Tracheobronchoscopy. Seyffarth.
92 Dialysis Serodiagnosis. (Abderhaldens Dialysierverfahren.) A. Bisgaard, A. Korsbjerg and O. Melikjanz.
93 Unfavorable Experiences with Friedmann's Treatment for Tuberculosis. (Erfahrungen mit dem Friedmannschen Tuberkulosemittel.) Schultes and E. Meinicke.
94 Hernia of the Diaphragm. (Zwerchfellbrüche.) W. Peters.

**87. Obstetric Hemorrhage.**—Among the various points emphasized by Jung in treatment of threatening hemorrhages after delivery, is that any attempt to tampon the uterus fails of its effect unless the uterus is packed clear down to the fundus; the tamponade should never be allowed to remain for more than twenty-four hours on account of the danger of infection. After delivery of the child, as long as the uterus feels hard and does not bleed, no attempt should be made to force out the placenta until at least forty-five minutes have elapsed; this law is frequently broken for various reasons but atony of the uterus is too often the penalty, with uncontrollable hemorrhage. Only in case of placenta praevia or premature separation of the placenta are earlier active measures justified. Atony is particularly liable to occur if the uterus has been abnormally distended by hydramnion, twins or hydrocephalus, or has been subjected to unusual strain at delivery from contracted pelvis, rigid soft parts or disproportionately large children. Also when the uterus has been rapidly evacuated by forceps or section before labor has been installed, and also when the woman has had similar atony of the uterus at preceding pregnancies; a habitual atony of the uterus may be feared. In all these circumstances 10 liters of boiled water kept at 40 or 50 C. should be in readiness, with material for tamponing and a rubber tube for the Momburg technic for belt constriction. No ergot should be given before expressing the placenta and the bladder should be empty at the time.

**89. Hyperglycemia in Elderly Diabetics.**—Hirschfeld calls attention to his report of two diabetic men of 69 and 72 who had an unusually high sugar content in the blood but it declined under restriction of albumin and increased intake of carbohydrates. He explains this as due to the more sluggish action of the kidneys in the elderly. Their kidneys are unable to throw off readily fluids and salts and this should be taken into account in the diet. He states that the elderly should not be allowed more than 70 gm. albumin. In the first case described the daily ration had been 120 gm. albumin; 100 gm. fat and 200 gm. carbohydrate. This was modified to 70 gm. albumin; 140 gm. fat, and 160 gm. carbohydrate, and the sugar in the urine dropped from 1.1 to 0.3 per cent. and the sugar in the blood from 0.35 to 0.16 per cent., with a blood-pressure of 138 and 136. In the second case the sugar in the urine dropped from 0.6 to 0.1 per cent.; in the blood from 0.28 to 0.14 per cent.; the blood-pressure from 128 to 124; the specific gravity of the urine from 1031 to 1025 and the nitrogen content from 18.06 to 10.04 gm. These changes were observed in ten days after the diet had been changed from the original 130 gm. albumin; 120 gm. fat, and 95 gm. carbohydrate to a ration consisting of 70 gm. albumin; 140 gm. fat, and 90 to 100 gm. carbohydrate. In both cases, when after this the intake of carbohydrates was increased, the sugar in the urine rapidly ran up. He suggests that these cases of high sugar content of the blood in the elderly may be regarded as a special form of renal diabetes, and the output depends essentially on the diet. Senile conditions and especially arteriosclerosis are probably responsible for this form.

## Deutsche Zeitschrift für Chirurgie, Leipzig

*CXXVIII, Nos. 5-6, pp. 433-628*

95 Gunshot Wounds in Peace; 200 Cases. (Schussverletzungen im Frieden.) A. Hagentorn (Russia).
96 Tuberculosis of the Buccal Mucosa and Gums. (Zur Therapie der Tuberkulose der Mundschleimhaut und des Zahnfleisches.) A. Tiedemann.
97 Technic for Resection of the Stomach (Magenresektion). H. Finsterer.
98 Suspension and Points of Support for Artificial Limbs. (Künstliche Glieder.) J. Dollinger.
99 Primary Carcinomas of Middle Jejunum. F. Kaspar.

*CXXIX, pp. 1-704. F. Trendelenburg Festschrift*

100 *Cancer of the Larynx. (Kehlkopfkrebs.) A. Barth.
101 To Repair Defect Left after Operation on the Middle Ear. (Osteoplastischer Verschluss retroaurikulärer Oeffnungen nach Antrumoperationen.) Becker.
102 Operative Treatment of Acute Pancreatitis: Four Cases. Dreesmann.
103 *Ectopia Vesicae. (Zur Heilung der angeborenen Harnblasen- und Harnröhrenspalte.) W. Dünkeloh.
104 Symptomatology of Brachial Plexus Paralysis. (Stammneurom des Plexus brachialis und Symptomatologie der Wurzel-, Durchflechtungs- und End-Lähmungen des Plexus.) v. Gaza.
105 Raising the Pelvis. (Der Siegeszug der Beckenhochlagerung.) W. Meyer and E. Grunert.
106 Local Anesthesia for Abdominal Operations. (Oertliche Schmerzverhütung bei Bauchoperationen.) Hackenbruch.
107 Chronic Thyroiditis; Two Cases. (Eisenharte Strumitis.) Heineke.
108 Fibroplastic Appendicitis. A. Löwen.
109 Rupture of Kidney from Contusion; Forty-Seven Cases. (Subkutane Nierenruptur.) E. A. Lüken.
110 Advantages of Closing up the Pylorus with Every Gastro-Enterostomy; Fourteen Cases. (Pyloroplicatio et Pylorotorsio.) G. Mertens.
111 *Total Dislocation of Spine in the Neck. (Totalluxation der Halswirbelsäule.) H. Meyer.
112 Surgery of the Appendix. (Zur Chirurgie des Wurmfortsatzes.) W. Meyer (New York).
113 *Operative Mobilization of Ankylosed Joints and Ultimate Outcome. E. Payr.
114 Operative Treatment of Gastric Ulcer; Thirty-Two Cases. G. Perthes.
115 Retroperitoneal Cysts. H. Rimann.
116 *Suture of the Patella. (Zur Frage der offenen Patellarnaht mit Nachuntersuchungen.) W. Sandrock.
117 Inflammation in and around the Shoulder after Contusion. (Die Arthritis acromio-clavicularis als wichtiges Glied in der Pathologie der stumpfen Schulterverletzungen.) R. Sievers.
118 *Progress in Operative Treatment of Pulmonary Tuberculosis. M. Wilms.
119 Disturbance after Operations on the Cecum. (Beschwerden nach Blinddarmoperationen.) W. Wolf.

100. **Cancer of the Larynx.**—Barth reviews his experience with 70 cases, all but 16 in men. The lesion was in an early stage in 8 but only 3 were willing to be operated on, and these are in good health to date after intervals of fourteen, four, and one and a half years. In 12 other cases the larynx was removed and the 8 patients who survived the operation lived for periods of four to thirty months but then succumbed to metastasis.

103. **Operative Treatment of Exstrophy of the Bladder.**—Dünkeloh summarizes the first 7 cases operated on by Trendelenburg according to his method of mobilizing and reuniting the walls to make a bladder cavity, and 11 other cases in which this method was applied by others. To this list he adds 8 unpublished cases from Trendelenburg's records. Complete continence was not realized in any instance, and only for an hour's duration in one case, but a simple spring contrivance can be worn on the penis which ensures continence at will. Pyelonephritis developed later in only one case.

111. **Dislocation of Cervical Vertebrae.**—Meyer reviews the cases on record and reports a new one. The partial paralysis in his case subsided when the luxation was reduced. This was accomplished by very gradual and cautious suspension with traction under scopolamin-morphin-ether general anesthesia. The Roentgen ray showed that the fourth cervical vertebra had been forced forward by ½ cm.

113. **Mobilization of Ankylosed Joints.**—Payr's report of the technic and outcome in this class of cases fills 124 pages and is profusely illustrated. The prognosis is growing constantly better when the stiff joint is mobilized and a flap of soft parts is interposed to serve as a buffer. Satisfactory results can now be confidently predicted for the knee in 70 or 80 per cent. of the cases, as well as for the shoulder, elbow and hip joints. The roentgenographs show that the new joint adapts itself to its functioning in a most satisfactory manner in the majority of cases. The causes of the failure in the unbenefited cases are analyzed in detail, and the lessons to be drawn from them are emphasized.

116. **Open Suture of the Patella.**—Sandrock has recently reexamined 84 of the 106 cases of fractured patella treated by suture at the Leipzig surgical clinic. None became infected by the operation and all the patients recovered, even those whose injured knee had been soiled with street dirt. The functional outcome was found surprisingly good.

118. **Operative Treatment of Pulmonary Tuberculosis.**—Wilms gives an illustrated description of what he calls his *Pfeiler-Resektion* of ribs at the back to permit the thorax wall to sink in and thus compress and immobilize the lung below. He also describes a number of cases in which he immobilized the lung by a filling of paraffin and others in which he combined this with resection of ribs. He cuts a segment of each rib in the back, cutting a strip out from the first to the eleventh rib, working through a vertical incision at the edge of the scapula, the incision carried slanting outward toward the bottom. He resects from 8 to 10 cm. in the upper ribs and from 12 to 15 in the lower ones. The stumps are forced almost together by the elasticity of the wall. By crushing the intercostal soft parts with a clamp, their sensibility is deadened so there is no pain to speak of afterward as the wounds heal. Of the 23 patients he treated by this pillar resection in 1911 and 1912, 4 are clinically cured; 9 materially improved and nearly cured, and 4 are merely improved. None succumbed to the operation. Four died including 2 who were operated on only as a last resort, one patient having angina pectoris besides his consumption.

## Monatsschrift für Kinderheilkunde, Berlin

*XIII, No. 2, pp. 69-112*

120 Roentgen Treatment not Advisable for Hypertrophy of the Thymus. W. Kaupe.
121 Treatment of Spasmophilia in Infants. Bernheim-Karrer.
122 Concentration of Hydrogen Ions in the Contents of the Infant's Stomach. A. Schackwitz.
123 Changes in Respiration Curve under Electric Tests as Aid in Diagnosis of Latent Tetany. (Atmungskurven bei Kindern mit spasmophilen Symptomen.) M. Masslow.

## Medizinische Klinik, Berlin

*July 7, X, No. 27, pp. 1127-1170*

124 Chronic Bronchitis and Bronchiolitis. Lommel.
125 Sleeping Sickness in German West Africa. (Schlafkrankheit in Kamerun.) P. Kuhn.
126 *Turtle Tubercle Bacilli Cultivated from Mastitis Following Friedmann's Treatment for Tuberculosis. (Specifische Mastitis nach Injektion des Friedmannschen Tuberkulosevaccine.) C. W. Bischoff and K. L. Schmitz. (Befund von Kaltblütertuberkelbacillen in einem Mammaabscess.) W. Fromme.
127 Inhalation Therapy. (Die moderne Inhalationstherapie, ihre wissenschaftliche Ausgestaltung und ihre Auswüchse.) Frentzel-Beyme.
128 Modification of Action of Drugs by Combining Them. (Die Wirkung der Arzneigemische.) M. Kochmann and E. Bürgi.
129 Behavior of Cardiovascular System under Physicotherapy. (Neuere Untersuchungen über das Verhalten von Herz und Gefässsystem unter der Einwirkung physikalischer Heilmethoden.) T. Schott.
130 Complement-Deviation Test of Urine not Reliable for Diagnosis of Tuberculosis of the Kidney. (Sind im Urin bei Nierentuberkulose tuberkulöse Gifte vorhanden?) M. Hetzer.

126. **Specific Mastitis after Friedmann's Treatment for Tuberculosis.**—Bischoff and Schmitz report the case of a woman of 36 given an intramuscular and later an intravenous injection of Friedmann's remedy. Not long after the intravenous injection she received a blow on both breasts in playing with her children, and in the course of the following weeks suppurating mastitis developed on both sides and what seemed to be the turtle tubercle bacillus was cultivated from the pus in pure cultures.

Fromme reports the bacteriologic findings in the case. Bacilli resembling in every respect, he states, the Friedmann strain of turtle bacilli were cultivated repeatedly from the pus of the mammary abscess. The latest cultures of the bacilli were made 104 days after the injection, demonstrating that the bacilli had retained their vitality in the body for this length of time. The mammary process proved essentially chronic in its course.

### Münchener medizinische Wochenschrift, Berlin

*June 30, LXI, No. 26, pp. 1433-1488*

131 *Advantages of Caramel in Diet of Diabetics. (Karamelkuren bei Diabetikern.) E. Grafe.
132 *Action of Sodium Bicarbonate on Pancreas Secretion. E. Wilbrand.
133 *Vaccine Therapy in Furunculosis. T. Messerschmidt.
134 Possibility of Transmission of Disease Germs on Surface of Bread. (Verschleppungsmöglichkeit pathogener Darmbakterien durch Brot.) Fürst.
135 *Severed Hand Heals in Place with Good Functioning. Schloessmann.
136 Satisfactory Outcome of Tying Off the Pylorus with 2 cm. Wide Strip of Fascia Lata; Thirteen Cases. (Dauerresultate der Pylorusausschaltung.) J. Galpern.
137 Gonorrheal Keratitis after Reinjection of Gonococcus Vaccine. (Konjunktivitis metastatica gonorrhoica.) J. Strebel.
138 *Spinal-Cord Tumor. (Rückenmarksgeschwulst.) T. Mauss.
139 *The German League for Medical Freedom. (Kurpfuscher als ärztliche Sachverständige vor Gericht.) O. Neustätter. Commenced in No. 25.

131. **Caramel Sugar for Diabetics.**—Grafe states that grape sugar caramelized at a temperature of 140 to 150 C. has proved a useful means to supply carbohydrates to diabetics without increasing the glycosuria. He tested its action on animals through two years of experiences, and then gave it to twenty-five diabetics and found that it usually had a decidedly favorable action on the acidosis. The daily dose was from 150 to 200 gm., his extreme range 100 to 300 gm. This was fractioned throughout the day and taken in brandy or coffee or in puddings. He generally gave it for two to four days at a time, repeating as necessary after interposed "vegetable days." By this means it is possible to supply 600 to 800 calories from carbohydrates, and in fluid form. Any tendency to diarrhea can be combated with astringents. Grape-sugar caramel seems to be borne better than cane-sugar caramel. It should contain only 3 or 5 per cent. sugar or less. There do not seem to be any contra-indications except coma and enteritis. The respiratory quotient shows marked increase in oxidation processes under its influence. Diabetics seem to assimilate best hard-baked crust, caramelized starch, etc.

132. **Effect of Sodium Bicarbonate on the Pancreas.**—Wilbrand found in tests on dogs with a duodenal fistula that sodium bicarbonate materially reduced the secretion in the pancreas. It can thus prove useful in sparing the pancreas when conditions require this.

133. **Vaccine Therapy and Furunculosis.**—Messerschmidt applied autogenous vaccine in 16 cases of chronic furunculosis and in 14 of the patients no further furuncles developed. The cure has persisted to date for two years in one case, although there are still occasional pimples. The 2 refractory patients were a weakly infant and a man with severe acne, both with the *Staphylococcus albus*, but probably this was not the primary causal germ.

135. **Restoration of Function after Replacing of Severed Hand.**—The boy's right hand had been cut off in a feed-chopper and hung by a strip of soft parts only 3 cm. wide. Fortunately the artery, ulnar nerve and four tendons were intact in this bridge, and as the hand was clapped back into place at once there was no infection. Except for a slightly livid appearance of the thumb and forefinger the hand looks and works now, over a year later, entirely normal; even the sensory functioning is perfect and the handwriting shows little change. Only when severe exertion is required is any difference noted. An interval of six hours had elapsed before the operation; it included suturing the periosteum, the joint ligaments, median nerve and twenty-two tendons.

138. **Spinal-Cord Tumor.**—Mauss' case is remarkable only in the complete recovery of the long bed-ridden woman of 50 after removal of a subdural psammoma as large as a bean, compressing the spinal cord between the eleventh and twelfth dorsal vertebrae. The first symptoms were noticed two years before and were treated as sciatica. The paralysis progressed with intense pains and sensation as if the legs were packed in ice. Three months after the operation the patient was on her feet and now, after two years, she can walk for an hour without fatigue.

139. **The German League for Medical Freedom.**—There is an organization in Germany, the *Zentralverband für Parität der Heilmethoden*, which unites under its banner all who are antagonistic to scientific, legally qualified medicine. It thus includes all types of those who prey on the credulity of the sick and by its ceaseless, wily propaganda it has enlisted many of the thoughtless. The criminal records of a number of those prominent in the league are reviewed here by Neustätter. He tabulates 32 who have a history of fine or imprisonment for a total of four deaths under their practices and thirty-one severe personal injuries; 6 who have several such counts to their credit, and about 20 who have paid similar penalties once or more for direct swindling or penitentiary offences. He tabulates only those cases of which he has verified data, and cites the amount of the fine and the penitentiary or jail sentence in each. The league has fifty-nine members of parliament enrolled in its membership.

### Therapeutische Monatshefte, Berlin

*July, XXVIII, No. 7, pp. 469-548*

140 *Lumbar Puncture as a Therapeutic Measure. H. Quincke.
141 *Dietetics and Pediatrics. L. Langstein.
142 Prophylaxis and Treatment of the Heart Weakness in Pneumonia. H. L. Elsner (Syracuse, N. Y.).
143 Quinin in Treatment of Syphilis. M. J. Breitmann.

140. **Lumbar Puncture as Therapeutic Measure.**—Quincke here discusses what can be hoped from lumbar puncture as a palliative or curative measure in various affections. Besides removing toxins and debris in the fluid thus withdrawn it may transform conditions in the serosa until spontaneous return to normal is possible, by removing the obstacle to the flow of blood and lymph and functioning of muscles. He warns that the patient should lie flat in bed for at least twenty-four hours afterward, abstaining from alcohol and only gradually returning to other positions. He takes up in turn in his ten pages each affection in which it could have a possible application, summarizing the leading principles in the statement that it should be applied or at least given a trial in all cases in which there is even suspicion that pressure from the cerebrospinal fluid is the cause of threatening symptoms or even of headache, stupor or vomiting. In acute cases of simple serous transudation, with or without inflammation, a single lumbar puncture may transform the clinical picture completely to a permanent cure. If the benefit is only transient, the puncture may have to be repeated daily or even oftener at first and then at longer intervals of three to ten days, and be kept up possibly for months. In this protracted course the indications should be reviewed anew each time, studying the course of the case, and the effects of each separate preceding puncture.

Always in applying lumbar puncture, he emphasizes, the pressure at the start and close and the amount withdrawn should be recorded each time. Systematically repeated lumbar puncture often permits a favorable outcome in suppurative bacillary cerebrospinal meningitis, and even in rare isolated cases of the tuberculous type. Quincke does not agree with those who denounce lumbar puncture if there is suspicion of a brain tumor. He advocates it in many cases as liable to improve the symptoms materially for a long time, even to the complete subsidence of choked disk.

141. **Dietetics for Children.**—Langstein reviews recent work showing the unceasing activity in the study of dietetics for sick and well infants and older children and the fine results already accomplished. Much that has already been learned might advantageously be applied to the diet of adults. Psychic influences affecting the course of digestion must be considered the more the older the child.

### Wiener klinische Wochenschrift, Vienna

*June 25, XXVII, No. 26, pp. 925-968*

144 Filtrable Viruses. (Neuere Ergebnisse in der Erforschung des filtrierbaren Virus.) R. Kraus.
145 Improved Technic for Serodiagnosis of Cancer. (Blutserumuntersuchungen bei Karzinomatösen mit neuer, verbesserter Methode.) G. Kelling.
146 Source of Antibody in Syphilitic Cerebrospinal Fluid. (Herkunft des luetischen Reaktionskörpers.) W. Spät.

147 *Roentgen-Ray Cancers. H. Bichler.
148 No Menstrual Enlargement of the Thyroid. (Zur Frage der menstruellen Schilddrüsenvergrösserung.) N. Woronytsch.

*July 2, No. 27, pp. 969-1012*

149 *Testicle Functioning in Dogs Not Impaired by Ligation or Resection of Vas Deferens. (Auffällige Befunde bei experimentellen Studien an Nebenhoden.) J. Kyrie and K. J. Schopper.
150 Toxic Action of Fat Fed to Laboratory Animals. (Fettintoxikation.) O. Weltmann.
151 Technic for Injection of Paraffin to Make Artificial Tumor in Pineal Gland Region. (Künstliche Tumoren der Zirbeldrüsengegend.) J. Novak.
152 Hydrops of the Bile Apparatus: Four Cases. ("Weisse Galle.") R. Steiner.
153 Operative Restoration to Normal Site of Congenitally Displaced Kidney; Two Cases. (Verlagerung der kongenitalen dystopen Niere.) Korencan.
154 Cholesterin Content of the Serum in Dermatology. F. Fischl.
155 The Public-Health Service in Egypt. (Das Sanitätswesen in Aegypten.) E. Weiner.

**147. Roentgen-Ray Cancers.**—The four cases reported all date from the early days of Roentgen work at Vienna. Three were in persons handling the rays professionally and in two of these a predisposition may have been afforded by syphilis; one developed general paresis along with the malignant degeneration of the Roentgen burn. The interval between the first signs of trouble and the development of the cancer was eight, fourteen, fifteen and eighteen years and amputation of the hand or arm saved the lives of the professionals. In the other case a boy of 9 was treated with Roentgen exposures on account of rebellious prurigo and eczema. The treatment was successful but the scalp was left almost entirely bald, and a year later a severe, intensely itching dermatitis developed here and on the back which resisted eighteen months of treatment but gradually most of the area healed over. Five years later the area on the front of the head which had never entirely healed over became painful and the tissues proliferated to form a small tumor which bled readily. It was easily excised and the microscope confirmed the malignant nature of the tumor. The patient has been free from disturbances during the two years since to date. Malignant degeneration of a Roentgen-ray burn is usually accompanied by much pain; nearly all writers on Roentgen cancers mention the intensely painful nature of the process.

**149. Ligation or Resection of Epididymis in Dogs.**—Kyrle and Schopper state that they found it impossible to induce atrophy of the testicle by ligation, resection or other injury of the epipidymis or ligation of the vas deferens. The testicle on that side was found gorged with sperma four or six months afterward. In one of the dogs spermatozoa were found in the arteries and veins in the region. Their arrangement in the blood-vessels seemed to indicate that they had made their way into the blood.

### Zentralblatt für Chirurgie, Leipsic

*July 4, XLI, No. 27, pp. 1145-1176*

156 Improved Technic for Harelip Operations. (Heftpflasterverband bei Hasenschartenoperationen.) Hofelder and A. Narath.
157 *Technic for Pyelography. E. Joseph.

**157. Technic for Pyelography.**—Joseph remarks that those clinicians with the most extensive experience with pyelography have been spared the mishaps occasionally reported by others. He thinks this can be explained only by better technic, and describes a number of minor technical points which he has found useful in his own service, such as the use of a fine catheter, not over No. 6, so that any excess of fluid injected runs back freely outside of the catheter. Sometimes the catheter can be introduced without effort far beyond the distance between bladder and kidney, the flexible tip rolling up in an abnormally wide ureter or pelvis; in this case roentgenoscopy at once, without injecting any opaque fluid, may give all the information desired. When the ureter catheter is in place and the urine is dripping from it, he withdraws the cystoscope and fastens the end of the catheter to the thigh with a strip of plaster. Abdominal breathing is shut off by tightening a girdle and all is made ready for the Roentgen exposure.

Then the freshly made, 10 per cent. collargol solution is slowly injected, stopping when the patient feels the slightest sensation of fulness or pain under the costal arch. Unless he can rely on the patient's intelligence he does not inject more than 3 or 4 c.c., but as a rule he injects twice this and sometimes up to 14 or 20 c.c. The moment the injection is completed the instantaneous exposures are made and then immediately the catheter is withdrawn and the patient is made to stand up so the fluid runs down into the bladder. By this technic it has not remained more than a minute in the kidney pelvis, and the patients could return home at once. He refrains from pyelography on principle unless the fine catheter slips readily in. If the mere introduction of the catheter causes pain or bleeding, he gives up the attempt at pyelography at once.

### Zentralblatt für Gynäkologie, Leipsic

*July 5, XXXVIII, No. 27, pp. 961-984*

158 *Radium Treatment of Uterine Cancer. (Radiumbehandlung bei Gebärmutterkrebs.) E. Schauta.
159 *Palpation of Fetal Head from the Rear. (Der diagnostische Hinterdammgriff.) E. Schwarzenbach.

**158. Radium Treatment of Uterine Cancer.**—Schauta remarks that it is certainly noteworthy that half of his twenty-two patients treated with radium are clinically cured to date. In all the uterine growth was in an inoperable stage. He operates in all operable cases, but insists on a course of radium treatment afterward, small doses with brief exposures at long intervals to ward off recurrence.

**159. Locating Fetal Head from the Rear.**—When the fetal head has passed the pelvic inlet, it can be felt from the rear, pushing the finger tips in deep between the coccyx and the anus. The parturient lies on her side and between labor pains the finger tips are worked in slowly and finally are pushed up with a quick, brief push. Unless the head can be felt when this is done, no attempt at forceps extraction should be made.

### Gazzetta degli Ospedali e delle Cliniche, Milan

*XXXV, Nos. 76-77, pp. 801-824*

160 The Cystoscope for Examination of Pleural Cavity, etc. (Diagnosi delle malattie polmonari per la pleuroscopia-toracoscopia.) E. Stolkind.
161 The Wassermann Reaction Is of Only Relative Import. A. Pasini.

### Policlinico, Rome

*XXI, Nos. 25-26, pp. 889-960*

162 Diphtheria Antitoxin in Puerperal Fever, etc. (Alcune speciali applicazioni del siero antidifterico.) R. Carnelli.
163 Bile Favorable Culture Medium for Malta Fever Germs. (Ricerche sperimentali sulla latenza del micrococco di Bruce nella bile.) F. Tallo.

*June, Medical Section No. 6, pp. 245-292*

164 Tumor in Right Frontal Lobe Causing Cerebellar Syndrome. O. Fragnito.
165 Basic Staining of Red Corpuscles. (Osservazioni sperimentali e considerazioni cliniche sulla basofilia dei globuli rossi.) E. Bianchi.
166 *Léri's Arm Sign in Brain Disease of Central Nervous System. (Il "segno dell 'avambraccio" nelle malattie mentali.) G. Vidoni.

*June, Surgical Section No. 6, pp. 257-308*

167 Tumor in Round Ligament Protruding through Inguinal Canal. G. Beccherle.
168 Fascia Flap to Bridge Gap in Tendon in Hand. (Il mio metodo di plastica tendinea in 2 casi di gravi lesioni traumatiche.) L. Fioravanti.
169 Hematuria from Varices in Bladder. G. Dialti. Commenced in No. 5.

**166. Arm Sign in Disease of Central Nervous System.**—Léri recently called attention to the long-course reflex elicited in the forearm when the arm, hanging relaxed, is sustained by the investigator's left hand under the wrist while with his right hand he rolls up the fingers and the hand on the forearm. As this is done the forearm bends as if drawn by an elastic cord. This is the physiologic reflex, and it may disappear in case of an organic lesion anywhere along the reflex route.

Vidoni states that he tested 301 patients in an asylum for this reflex, the findings confirming Léri's statements in every

particular. He found it impossible to elicit the reflex in any case of organic hemiplegia.

### Riforma Medica, Naples

*June 27, XXX, No. 26, pp. 701-728*

170 *The Liver with Heart Disease. (Sul fegato dei cardiaci.) A. Tomaselli.
171 Achondroplasia. R. Massalongo and C. Piazza. Commenced in No. 25.
172 *Sutured Stab Wound of the Heart. (Ferite del cuore.) J. Bruchi.
173 Echinococcus Disease in Three Young Children. L. Fioravanti.

170. **The Liver with Heart Disease.**—Tomaselli examined repeatedly the condition of the liver in sixty patients with heart disease. In 80 per cent. the condition of the liver was unmistakably connected with the heart trouble; in the others the liver was enlarged, but there was no tendency to edema. A history of malaria or abuse of alcohol was evident in these cases. The prognosis seems to be better when the liver has suddenly grown large than in cases with more gradual enlargement. In any event, enlargement of the liver in the course of heart disease must be regarded as a sign of failing compensation, and one of the gravest.

172. **Suture of Stab Wound of Heart.**—The young man was stabbed in the right thigh and in the right auricle. Bleeding profusely, he sprang on a bicycle and raced to the hospital nearly half a mile distant where the wound was sutured at once, three stitches being taken in the auricle. Salt solution was administered by the subcutaneous drop method before and during the operation and afterward. Complete recovery soon followed.

### Archives des Sciences Biologiques, St. Petersburg

*XVIII, Nos. 1-2, pp. 1-212. French Edition*

174 The Works of V. V. Podvyssotsky. V. N. Klimenko.
175 *The Physiology of Sleep. N. A. Rojansky.
176 The Physiology of the Thyroid. (Le phosphore, l'azote et les lipoides chez les animaux thyroidectomisés.) A. I. Youchtchenko.
177 Lime Sterilization of Drinking Water. (Les résultats qu'a fournis . . . la désinfection de l'eau du Don par une solution de chlorure de chaux.) G. J. Bronowicki and S. K. Dzerszgowski.

175. **The Physiology of Sleep.**—This long communication reporting research on the physiology of sleep was done under Pawlow. The nervous mechanism of sleep, the extinguishing of the conditional reflexes as sleep came on, were studied principally by the relaxation of the muscles in the neck accompanying the first weakening of the conditional reflex. A special rubber-bulb apparatus recorded the moment when the muscles in the dog's neck relaxed—these are the first to relax in dogs and about the last in cats. The conditional reflexes were elicited among other means with food, estimating the intensity of the reflexes by the number of drops of saliva that dripped from a fistula in the salivary glands; sleep coming on inhibits the secretion. The purpose of sleep seems to be to prevent excessive losses of energy. The mechanism for sleep should therefore, and it does, seal up the source for loss of energy as it arrests the functioning of the muscular system, shutting off all communication between the motor system and the external world. A period of sleep in each twenty-four hours conserves energy, but Rojansky insists that it is theoretically impossible to understand why it is such a vital necessity. He remarks that the best evidence of the absolutely vital necessity for sleep is that even in the busiest and most hurried marts of trade, where "time is truly money," yet no one has unlearned the habit of sleeping a certain number of hours in the twenty-four. He cites experiments showing that puppies died when kept without sleep for five or ten days and older dogs eight to twenty days, and Daddi found that the dogs died sooner when they were fed than when no food was given. Rojansky suggests that the fatal outcome may be attributed in part to the measures necessary to keep the dogs from sleeping; they must have been of such a nature that the dogs really suffered from overexcitement and overexertion in addition to the loss of sleep. There is much, he concludes, to sustain the assumption of an inherent periodicity regulating sleep, similar to the periodical fluctuation of the temperature during the twenty-four hours regardless of whether the individual is "turning night into day" or not. There may be a periodical chemical rhythm in the secretion or other functioning of glands with an internal secretion, and the problem of sleep can be best elucidated, probably, by study of all the daily periodical functions of the organism and the relations between them and processes of inhibition. Sixteen pages are devoted to the tabulated "hypnograms" of the nine dogs, and the titles of 446 articles on sleep are listed.

### Russky Vrach, St. Petersburg

*XIII, No. 12, pp. 397-464. V. Afanassieff Number*

178 *Secretory Properties of Tumors. I. Shirokogoroff.
179 Action of Epinephrin on the Liver. E. Mazing.
180 *Organotropic Action of Salvarsan. I. Kaplan.
181 *Abderhalden's Reaction. A. Krupsky.
182 Acute Aleukemic Lymphadenosis. Mazing and Shirokogoroff.
183 Biology of Chondriosomes. V. Rubashkin.
184 Islands of Langerhans in the Pancreas. G. Kull.
185 Primary Fibrosarcoma in Peritoneum. V. Sorokin.
186 Sarcomas of the Eyeball. T. Verkke.
187 Cause of Leprosy. A. Paldrok.
188 Deformity of Spine and Chest; Two Cases. G. Adolphi.
189 Splenomegaly. K. Dehio.
190 Advantages of Two Test-Breakfasts. V. Zimmerman.
191 Enteritis in the New-Born in Connection with General Infection through the Intestines. V. Joukovsky.
192 *Technic for Injection of Salvarsan. E. Terrenson.

178. **Secreting Properties of Tumors.**—Shirokogoroff states that the cells of some new growths seem to possess secretory properties similar to those of the mother tissues. The presence in the cells of cancer of small granules known as Altman's granules, chondriosomes, confirms this opinion. They appear in the form of very small droplets which may attain in some cases the size of the granules of a red blood corpuscle. The process of development and growth of these formations is the same as in a normal gland, and indicates that the cells of a malignant growth containing these chondriosomes have a secretory function.

180-192. **Technic for Salvarsan and Its Affinity for Tissues.**—Kaplan injected an alkaline solution of salvarsan mixed with normal salt solution into twenty rabbits, ten cats and seven dogs, both intravenously and hypodermically. The central nervous system afterward showed hyperemia and hemorrhages, especially in the cerebellum and spinal cord. The cells showed no changes, except a slight chromatolysis in the large pyramidal cells, in cells of Purkinje, the medulla and spinal ganglia. There were also found hyperemia in the kidneys and fatty degeneration of the renal epithelium in dogs. Kaplan comes to the conclusion that salvarsan has an organotropic action with a special affinity for the nervous system.

Terrenson recommends for intramuscular injection acid solutions of salvarsan which he used with excellent results on more than 700 patients. He never used more than 4 c.c. of water, without any alcohol. The injection was made along Duhot's line, extending from the anterior crest of the ilium down to the lower end of the sacrum. The needle is inserted on this line where it is crossed by a line drawn upward along the external third of the femur. The needle must be inserted perpendicularly to the muscle, not deeper than 1 inch. For intravenous injections he uses alkaline salvarsan solutions. The acid solutions are especially indicated in syphilitic lesions of the vessels and heart; he found the salvarsan an excellent and harmless remedy, especially when given in connection with mercury.

181. **Serodiagnosis by Protective Ferments.**—Krupsky studied the value of Abderhalden's reaction in pregnancy, in the post-partum period, in different gynecologic affections, in cancer, etc., and comes to the conclusion that identical results can be obtained in extremely varied conditions, as, for instance, in pregnancy and malignant disease, yet in pregnancy the reaction is always positive even in the earliest stages. It may help to diagnosticate pregnancy in its earliest stages, remaining positive even two weeks after delivery. This establishes its medicolegal value in cases for instance, of criminal abortion or passed normal labors, when this reaction may confirm the assumption of a preceding pregnancy.

### St. Peterburger medizinische Zeitschrift

*XXXIX, Nos. 10-11, pp. 123-145*

193 *Treatment of Eclampsia on Basis of Retention of Salt. (Zur Therapie der Eklampsie auf Grund von Beobachtungen der Kochsalzretention.) A. Christiani.

194 Injury of the Vagus during Removal of Tumors in the Neck. F. Weber.

195 Importance of Diverting the Course of the Urine in Resecting the Urethra. Klopfer.

193. **Treatment of Eclampsia on Basis of Retention of Salt.**—Christiani insists on the importance of the retention of salt as an element for the prognosis in eclampsia. In a case reported this, in connection with the other symptoms, compelled immediate cesarean section, saving both mother and child in an extremely severe case of eclampsia. Notwithstanding venesection and infusion the amount of urine fell off to 135 c.c.; the albumin had increased from traces to 12 per thousand, while there was only 0.4 c.c. of salt to the liter. The morning after the operation the albumin had dropped to 2 per thousand while the salt had risen to 2 c.c per liter. In some other typical cases cited the severe symptoms appeared and disappeared parallel to the drop and rise of the salt curve in the urine. His experience has been that retention of salt occurs with the uncontrollable vomiting of pregnancy and even before there are signs of albuminuria. Its importance as a guide to treatment in this case is obvious.

### Hospitalstidende, Copenhagen

*July 1, XLII, No. 26, pp. 817-840*

196 *Benzol in Leukemia. H. C. V. Møller.

196. **Benzol in Leukemia.**—Møller reports three cases, all in women between 39 and 62, developing about the same time and treated at the Faxe public hospital. The leukemia was of the myeloid, lymphatic or pseudoleukemic type. Under benzol treatment improvement became speedily manifest; one patient could not take the capsules and the benzol was given in small oatmeal-gruel enemas. To each patient 1 gm. was given the first day, increasing by 1 gm. a day to a total of 4 gm.; then the daily dose was kept at 3 or 3.5 gm. systematically until the two true leukemia patients in the course of four months had taken 430 or 360 gm. benzol. In the pseudoleukemia patient the blood seemed to undergo a destructive process, proving fatal about a month after suspension of the medication, with dyspnea, and bleeding from the gums. The reds had dropped to 900,000 and the whites to 625. The improvement at first under the benzol had been striking. The myeloid patient seems to be clinically cured to date, eight months since discontinuance of treatment; the lymphatic patient seemed to be also clinically cured but has succumbed since to intercurrent pneumonia.

### Hygiea, Stockholm

*LXXVI, No. 11, pp. 625-688*

197 *Technic for Effectual Treatment of Gonorrhea in Women. (Om gonorrens behandling och botbarhet hos kvinnan.) J. Almkvist.

198 Benzol and Thorium X in Leukemia. S. Berg.

197. **Gonorrhea in the Female.**—Almkvist is convinced that the reason why the usual treatment for gonorrhea in women so often fails to cure is because the antiseptics used in fluid form do not stay long enough in contact with the mucosa—conditions in the female being far less favorable than in the male. To obviate this he applies the disinfectant in the form of a jelly, injecting it under pressure so that the entire mucosa lining is stretched, thus smoothing out the folds and wrinkles and permitting the disinfectant to make its way into the crevices and by its semisolid consistency to cling there. He gives the detailed histories in tabulated form of 20 cases treated in this way and repeatedly reexamined for months afterward, in 8 cases along with the husbands, both being permanently free from gonococci afterward. In 5 cases the course of treatment required only from nine to fourteen days; in 5 others from twenty-one to twenty-six days; in 11, from thirty-five to ninety-eight, the longer course being necessary on account of complications. In one of the certainly permanently cured cases the gonorrhea was of nine months' standing. He never witnessed any untoward by-effects from injecting the medicated jelly into the uterus as a prophylactic measure even when no gonococci could be discovered in the cervix. All the patients but two had urethritis, and all but two had cervicitis. It is important, he reiterates, to cleanse the mucosa perfectly before injecting the jelly. His formula for the latter is 3 parts tragacanth; 2.5 parts alcohol, and 100 parts distilled water, to which he adds 1 per cent. of a silver salt. Fully 20 c.c. of the jelly are necessary in treating gonorrhea in the rectum, but in the cervix and urethra about 3 c.c. is generally sufficient.

### Ugeskrift for Læger, Copenhaven

*June 4, LXXVI, No. 23, pp. 1041-1084*

199 *Overeating as Cause of Sickness. (Overeernæring som Sygdomsaarsag.) E. E. Faber.

200 Familial Tuberculosis. V. Holm.

*June 11, No. 24, pp. 1085-1112*

201 *Improved Technic for Mercurial Treatment: Inhalation Device. (Emikuren.) C. Engelbreth.

*June 18, No. 25, pp. 1113-1142*

202 Venous Stasis as Cause of Certain Complications of Operations for Glaucoma. (Om Glaukom. V.) C. F. Heerfordt.

203 Severe Reaction, with Albuminuria, to Dose of Purgen. L. Balslev.

199. **Overeating as Cause of Sickness.**—Faber is convinced that many of the morbid conditions credited to the "uric acid-diathesis" are in reality merely the effects of eating too much either at the time or previously. His list of 283 corpulent and 364 not corpulent patients shows how chronic rheumatism, lumbago, varices and constipation are far more prevalent among the corpulent. The combination of rheumatism and nervous symptoms in the corpulent is especially frequent. Comparison of the mortality of the corpulent shows a much higher mortality from heart and kidney disease and apoplexy. This may signify that the corpulent have less resisting power. But his main argument is the benefit which follows restriction of the diet. Rheumatism, neuralgia, etc., are liable to show prompt and persisting improvement when the diet is restricted so that the weight is reduced. Chronic rheumatism, refractory to heat, baths, massage and drugs may yield promptly and permanently when a few pounds of fat have been thrown off and it may return when the patient over-eats again. He found the blood-pressure unusually high in thirteen of fifteen corpulent patients; it ran up to 220 in two. Restriction of the diet alone may bring a high blood-pressure down to normal as the patient throws off superfluous flesh. The latter is not the cause of the rheumatism, etc., but both are due to overeating.

201. **Engelbreth's Mercury Inhalation Method of Treating Syphilis.**—The initials of this title form the name "emi" given to this method of treatment. Engelbreth claims for it accurate dosage—which is never possible with inunctions—convenience and simplicity of application, and remarkable efficacy, the mercury given in this way displaying its full potency without drawbacks. The mercury is vaporized by the heat of the water kept at 60 C. and the air passing through it is warmed to 50 C. The pure mercury precipitate on cotton is in a cylindrical glass with perforated top and bottom through which passes the air. Weighing the glass cartridge before and after use shows a loss of weight of 45 mg. mercury in thirty minutes, and this is the standard dose. With this technic, he reiterates, there are no dangerous deposits of mercury while the drug is brought directly into the arterial blood. He graduates the dose as a rule by the patients' weight and condition, beginning with a twenty-minute sitting and increasing to thirty, forty or sixty minutes, with constant supervision of pulse and weight. Headache, dizziness or diarrhea show that the dose is too large. One of the advantages of the method is that on stopping the inhalation there is no further absorption, so the medication is at all times under control. The course consists of twenty to thirty sittings. In tabes he gives only half doses. The results of this "emi-treatment" seem to have been unusually good in the 100 cases he reports.